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Vol. 974 Number 1

OFFICIAL GAZETTE

of the UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 5, 1978

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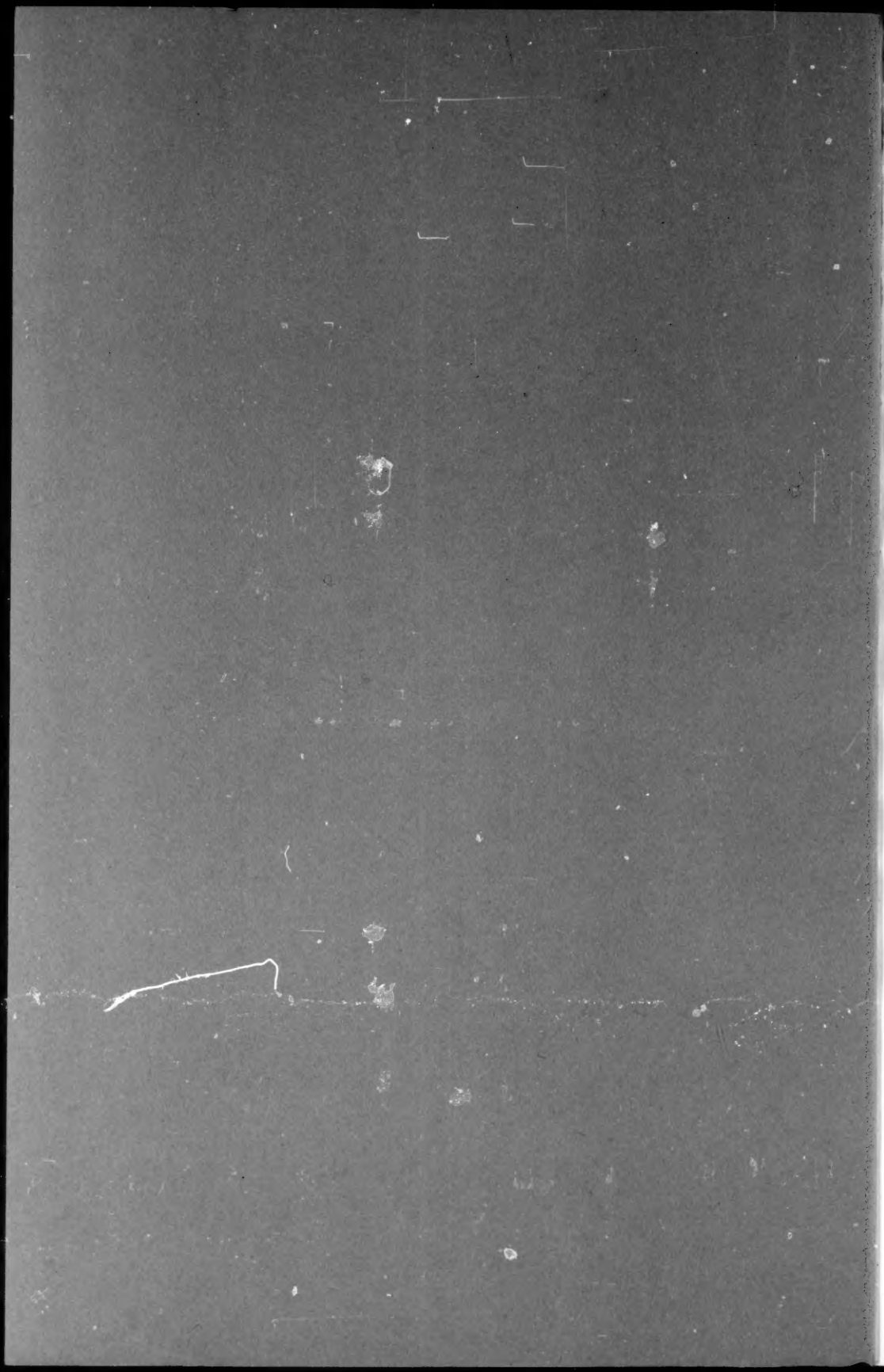

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

Set VII of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders 612 to 624 issued between January 1, 1978 and March 31, 1978. All of these addenda have been consolidated into Set VII of "Addenda to the Classification Definitions."

Class	Class	Class	Class
2	108	220	329
4	112	221	332
7	116	222	333
13	118	223	335
15	128	226	336
16	131	228	337
19	132	235	338
21	137	242	339
24	138	246	340
28	140	248	343
29	148	250	346
30	152	251	350
33	156	252	351
35	160	264	352
40	162	272	353
42	166	273	354
43	172	274	355
46	173	281	356
52	175	294	358
53	177	301	360
62	178	302	361
65	185	307	362
70	191	308	364
73	194	310	365
74	197	312	402
81	200	313	404
84	201	314	424
86	202	315	425
89	203	318	427
92	206	322	428
96	209	323	431
98	211	324	520
100	219	325	Classes (526)
106		328	

The following is a summary of the newly established classes issued between April 1976 and June 1978.

Class	Class	Class	Class
7	366	542	D14
28	400	544	D15
198	407	548	D24
361	429	560	D25
362	526	568	D28
363	528	D11	D29
364	536	D13	D36
365			

ALFRED C. MARMOR,
Administrator for Documentation,
August 10, 1978.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 27,447, Re. S.N. 893,110, Filed Apr. 3, 1978, Cl. 164/76, PROCESS OF USING A LOW-CARBON STEEL COMPOSITION IN A CONTINUOUS-CASTING PROCESS, John H. Richards, Owner of Record: *United States Steel Corporation, Pittsburgh, Pa.,* Attorney or Agent: Arthur J. Greif, Ex. Gp.: 322

3,914,461, Re. S.N. 843,647, Filed Oct. 19, 1977, Cl. 427/33, ELECTROSTATIC COATING METHOD, William C. Goodridge, Owner of Record: by mesne assigmts. to *Canada Wire and Cable Company, Limited, Toronto, Ontario, Canada,* Attorney or Agent: Ira S. Dorman, Ex. Gp.: 162

3,968,935, Re. S.N. 923,921, Filed Jul. 12, 1978, Cl. 239/289, CONTOURED SUPERSONIC NOZZLE, John S. Sohre, Owner of Record: *Inventor,* Attorney or Agent: David S. Fishman, et al., Ex. Gp.: 313

3,970,246, Re. S.N. 923,085, Filed Jul. 10, 1978, Cl. 236/44 C, AIR CONDITIONING CONTROL SYSTEM, Russell G. Attridge, Jr., et al., Owner of Record: *Ranco Inc., Columbus, Ohio,* Attorney or Agent: James T. Hoffmann, et al., Ex. Gp.: 344

3,985,230, Re. S.N. 898,327, Filed Apr. 20, 1978, Cl. 206/424, CARTON, Melvin H. Meyer, et al., Owner of Record: *Stone Container Corporation, Chicago, Ill.,* Attorney or Agent: Morris Relson, et al., Ex. Gp.: 240

3,989,197, Re. S.N. 923,924, Filed Jul. 11, 1978, Cl. 241/43, APPARATUS FOR PULPING AND GRADING WASTE PAPER, Walter Neitzel, Owner of Record: *Voith, J. M. G.m.b.H., Heidenheim, Germany,* Attorney or Agent: David S. Kane, et al., Ex. Gp.: 325

4,039,416, Re. S.N. 922,719, Filed Jul. 7, 1978, Cl. 204/192 N, GASLESS ION PLATING, Gerald W. White, Owner of Record: *Illinois Tool Works Inc., Chicago, Ill.,* Attorney or Agent: Robert W. Beart, et al., Ex. Gp.: 114

4,065,270, Re. S.N. 901,032, Filed Apr. 28, 1978, Cl. 23/299, PROCESS FOR PURIFYING SODIUM HYDROXIDE, Keiichi Nakaya, et al., Owner of Record: *Asahi Glass Co., Ltd., Tokyo, Japan,* Attorney or Agent: Norman F. Oblon, et al., Ex. Gp.: 171

4,087,180, Re. S.N. 923,068, Filed Jul. 10, 1978, Cl. 355/17, PHOTOGRAPHIC PRINTING METHOD, Robert F. Di Natale, Owner of Record: *Inventor,* Attorney or Agent: Joseph S. Iandiorio, Ex. Gp.: 212

4,096,473, Re. S.N. 921,483, Filed Jul. 3, 1978, Cl. 340/237 S, HIGH OUTPUT SMOKE AND HEAT DETECTOR ALARM SYSTEM UTILIZING A PIEZOELECTRIC TRANSDUCER AND A VOLTAGE DOUBLING MEANS, Louis P. Sweany, et al., Owner of Record: *P. R. Mallory & Company Inc., Indianapolis, Ind.,* Attorney or Agent: Charles W. Hoffmann, et al., Ex. Gp.: 234

PATENT NOTICES

Certificates of Correction for the Week of Sept. 5, 1978

3,847,602	4,073,946	4,081,356	4,084,748
3,862,296	4,074,306	4,081,625	4,084,919
3,971,065	4,074,499	4,082,032	4,085,191
3,986,748	4,074,926	4,082,033	4,085,287
3,991,304	4,075,094	4,082,840	4,085,392
3,995,041	4,075,942	4,082,956	4,085,409
3,997,356	4,078,055	4,083,055	4,085,510
4,001,570	4,078,096	4,083,166	4,085,589
4,005,941	4,078,171	4,083,302	4,085,604
4,021,729	4,078,387	4,083,374	4,086,199
4,025,974	4,078,873	4,083,580	4,086,293
4,037,102	4,079,436	4,083,726	4,086,374
4,055,946	4,079,568	4,083,762	4,086,429
4,065,276	4,079,602	4,083,815	4,086,519
4,066,894	4,079,614	4,083,820	4,086,585
4,068,053	4,079,649	4,084,023	4,086,800
4,069,016	4,079,757	4,084,069	4,087,081
4,069,628	4,079,877	4,084,083	4,087,197
4,070,439	4,080,284	4,084,259	4,087,253
4,070,865	4,080,631	4,084,605	4,087,428
4,070,920	4,080,878	4,084,624	4,087,587
4,071,422	4,080,981	4,084,649	4,087,588

Dedication

3,991,280.—*Dennis Bryan James*, Rumson, *Chao Kai Liu*, Matawan, and *Robert McKee Smith*, Holmdel, N.J. MONOBUS VARIABLE RESISTANCE TRANSMISSION CIRCUIT. Patent dated Nov. 9, 1976. Dedication filed July 14, 1978, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby dedicates to the Public the entire term of said patent.

Disclaimers

3,724,285.—*James M. Lapeyre*, New Orleans, La. CONVEYOR DRIVE. Patent dated Apr. 3, 1973. Disclaimer filed May 8, 1978, by the assignee, *The Laitram Corporation.*

Hereby enters this disclaimer to claims 18–22 of said patent.

3,903,610.—*John B. Heaviside*, Huntingdon, and *Franklin W. Smith, Jr.*, Hauppauge, N.Y. APPARATUS FOR MEASURING MAGNETIC FIELD DIRECTION. Patent dated Sept. 9, 1975. Disclaimer filed July 17, 1978, by the assignee, *Safe Flight Instrument Corporation.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,009,611.—*George Warren Koffer*, Los Altos, and *Doud Roger Branham*, Redwood City, Calif. HAND-HELD MICROPIPETTOR WITH IMPROVED PIPETTE TIP EJECTOR. Patent dated Mar. 1, 1977. Disclaimer filed July 3, 1978, by the assignee, *Oxford Laboratories Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,065,978.—*Henry Meresz*, Wheeling, and *Michael N. Tranquilla*, Elmhurst, Ill. SYNCHRONIZED DRIVE AND CABLE HANDLING SYSTEM FOR A ROTATIONAL MACHINE ELEMENT. Patent dated Jan. 3, 1978. Disclaimer filed June 19, 1978, by the assignee, *G. D. Searle & Co.*

Hereby enters this disclaimer to all claims of said patent.

Patents Available for Licensing or Sale

3,092,334. SHOWER ATTACHMENT. Dana Peterson, 464 B Ave., Coronado, Calif. 92118.

3,680,237. OUT-DOOR ILLUMINATED SIGN. John G. Finnerty, 251 DeGrand Ave., Teaneck. N.J. 07666.

3,874,945. METHOD OF FABRICATING PLASTIC PRINTING PLATES. Vaclav Misek, 8515 Colonial Drive, Stockton, Calif. 95209.

4,034,611. PARICULATE SAMPLING PROBE. James E. Harling, M. F. Laughton, APCD-EPS Environment Canada, Ottawa, KIAIC8, Canada.

4,037,581. SCREEN DEVICE FOR STOVE OVENS. Thomas Trifiletti, 2 Furlong Drive, Albany, N.Y. 12205.

4,044,476. EDUCATIONAL METHODS AND DEVICES. Jeanette B. Marsh, 1400 N. Lake Shore Drive, 14–M, Chicago, Ill. 60610.

4,056,897. PLANTER DESIGN AND CONSTRUCTION. Mary Ellen and John Scott Pearce. Correspondence to: E. Barron Batchelder, Sixbey, Friedman & Leedom, P. C., Suite 206,2001 Jefferson Davis Hwy., Arlington, Va. 22202.

4,064,880. SANITARY TUBULAR NAPKIN FOR MALES. Dexter J. Logan, P.O. Box 1012, West Covina, Calif. 91793.

4,065,878. AUTOMATIC DOOR OPENING AND SHUTTING DEVICE. Sachio Tsugane, Japan. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501.

The following two patents are offered by John O. Richards, 980 Mill Circle, Apt. #99, Alliance, Ohio 44601.

3,835,507. ROPE HOLDING DEVICE.

3,578,840. REVOLVING REFLECTOR.

The following nine patents are offered by Paul F. Taylor, P.O. Box 468, Crossville, Tenn. 38555.

3,811,871. PROCESS FOR CLASS IV B METALS ORE REDUCTION.

3,948,637. PROCESS FOR CLASS IV B METALS ORE REDUCTION.

3,784,593. PROCESS FOR CLASS IV B METALS ORE REDUCTION (IMPROVEMENT).

3,912,498. PROCESS FOR CLASS IV B METALS ORE REDUCTION.

3,980,471. PROCESS FOR CLASS III B METALS ORE REDUCTION.

3,791,815. PROCESS FOR LANTHANIDE AND ACTINIDE METALS ORE REDUCTION.

3,966,455. PROCESS FOR ILMENITE ORE REDUCTION.

3,833,353. PROCESS FOR CLASS VIII B METALS ORE REDUCTION.

3,958,978. PROCESS FOR COPPER METAL ORE REDUCTION.

The General Electric Company, a corporation of the State of New York, having a place of business at 1 River Road, Schenectady, N.Y., is the owner by assignment of the following 83 patents.

Applications for licenses may be addressed to: Walter C. Bernkopf, Division Patent Counsel Contractor Equipment Business Division, General Electric Company, 1285 Boston Ave., Building 21EW, Bridgeport, Conn. 06602.

3,076,882. ELECTRIC CIRCUIT BREAKER.

3,104,297. CIRCUIT BREAKER WITH AUXILIARY SWITCH.

3,105,132. GUIDE MEANS FOR SUPPORTING A CONTACT CROSS-ARM OF A CIRCUIT BREAKER.

3,134,877. PANELBOARD SWITCH UNIT.

3,135,895. PLUG-IN PANEL UNIT.

3,137,780. CIRCUIT BREAKER HANDLE ASSEMBLY.

3,141,947. FRONT-OPERATED SWITCH WITH BAIL TYPE HANDLE.

3,141,997. ELECTRIC PANEL ASSEMBLY.

3,143,627. MULTIPOLE CIRCUIT BREAKER WITH THREE PART INSULATING CASING.

3,155,786. ENCLOSURE WITH LOCKABLE HANDLE.

3,155,805. MULTIPOLE CIRCUIT BREAKER WITH NOVEL CONTACT ARM CONSTRUCTION.

3,158,716. ELECTRIC CIRCUIT BREAKER.

3,165,372. CABLE CONNECTOR ASSEMBLY.

3,171,708. ADAPTER FOR NEUTRAL TERMINAL BAR.

3,179,761. ELECTRICAL SWITCH AND FUSE HOUSING COMBINATION HAVING A PIVOTALLY MOUNTED ADAPTING MECHANISM OPERABLE INDEPENDENTLY OF ITS MOVABLE COVER.

3,179,769. CIRCUIT BREAKER WITH ADJUSTABLE TRIPPING MEANS.

3,179,850. PROTECTIVE RELAY.

3,181,041. CIRCUIT BREAKER WITH MAGNETIC TRIP ADJUSTING MEANS.

3,188,412. RACKING MECHANISM FOR METAL ENCLOSED ELECTRIC SWITCHGEAR.

3,188,413. EXPANDABLE SWITCHGEAR HOUSING FOR DRAWOUT ELECTRIC APPARATUS.

3,188,414. RELEASABLE STOP MEANS FOR A MOVABLE UNIT IN A STATIONARY ENCLOSURE.

3,188,415. SWITCHGEAR DISCONNECT MECHANISM.

3,193,633. RACKING MECHANISM INCLUDING A DIFFERENTIAL PULLEY SYSTEM.

3,194,934. SEGMENTED CONTACT ASSEMBLY HAVING PIVOTAL AND SIDEWISE-ROTATABLE CONTACT SEGMENTS.

3,198,518. SHEET MATERIAL HANDLING APPARATUS.

3,204,150. TERMINAL CONNECTIONS FOR CIRCUIT PROTECTIVE DEVICES.

3,205,325. CIRCUIT BREAKER TRIP DEVICE.

3,217,090. PANELBOARD.

3,259,718. FUSIBLE ELECTRIC SWITCH EQUIPPED WITH COMBINATION FUSE HOLDER AND ARCING CONTACT.

3,260,825. CIRCUIT BREAKER WITH AMBIENT COMPENSATING MEANS.

3,263,132. CIRCUIT BREAKER LOAD CENTER.

3,264,427. ELECTRIC CIRCUIT PROTECTIVE DEVICE WITH ENERGY DIVERTING MEANS.

3,274,356. DRAW-OUT FUSED SWITCH-GEAR APPARATUS.

3,288,956. DRAW-OUT SWITCH-GEAR INTERLOCK APPARATUS.

3,309,580. CIRCUIT BREAKER LOAD CENTER.

3,313,898. CIRCUIT BREAKER WITH THERMAL TRIP DEVICE OF HIGH SHORT-CIRCUIT WITHSTANDABILITY.

3,317,794. OVERCURRENT PROTECTIVE MEANS.

3,317,795. OVERCURRENT PROTECTIVE MEANS.

3,333,155. INVERSE OVERCURRENT-TIME DELAY CIRCUIT PROTECTIVE DEVICE UTILIZING NONLINEAR RESISTANCE.

3,333,157. PLUG-IN TYPE CONTROL DEVICE PANEL ASSEMBLY WITH ANGULARLY CONTRASTING CONTACT PORTIONS.

3,350,525. CIRCUIT BREAKER RESETTING MECHANISM.

3,360,690. CIRCUIT BREAKER PANELBOARD OR LOAD CENTER.

3,389,359. CHANGE OF STATE CURRENT LIMITER DEVICES WITH STACKED SEGMENT CONSTRUCTION.

3,389,360. CHANGE OF STATE CURRENT LIMITER HAVING FLAT PLATE CONSTRUCTION.

3,404,316. CIRCUIT BREAKER SEGREGATION SYSTEM.

3,423,598. PEAK DEMAND CURRENT LIMITING CONTROL SYSTEM.

3,436,597. ELECTRIC CIRCUIT BREAKER WITH ASSISTED ARC INTERRUPTION.

3,436,700. PARALLEL ASSISTED CIRCUIT INTERRUPTING DEVICE.

3,453,568. ELECTRIC CIRCUIT BREAKER WITH IMPROVED AUXILIARY DEVICE.

3,454,832. ELECTRIC CIRCUIT INTERRUPTER.

3,466,503. ASSISTED ARC A.C. CIRCUIT INTERRUPTER.

3,475,711. ELECTRIC CIRCUIT BREAKER OPERATING MECHANISM AND ASSEMBLY THEREOF.

3,489,870. CASCADED ELECTRIC CURRENT INTERRUPTING DEVICE WITH IONIZED GAS ASSISTING IN BREAKDOWN AND EVENTUAL ARC EXTINCTION.

3,489,871. ELECTRIC CURRENT INTERRUPTING DEVICE WITH IONIZED GAS ASSISTING IN BREAKDOWN AND EVENTUAL ARC EXTINCTION.

3,489,872. MODULAR TYPE MULTI-STAGE INTERRUPTER WITH IONIZED GAS ASSISTING IN BREAKDOWN AND EVENTUAL ARC EXTINCTION.

3,493,815. ELECTRIC PROTECTIVE CIRCUIT.

3,501,677. CURRENT LIMITING STATIC ALTERNATING CURRENT CIRCUIT BREAKER.

3,504,233. ELECTRIC CIRCUIT INTERRUPTING DEVICE WITH SOLID STATE SHUNTING MEANS.

3,515,940. PARALLEL-ASSISTED CIRCUIT INTERRUPTING DEVICE.

3,526,812. POWER SUPPLY FOR CIRCUIT BREAKER TRIPPING.

3,533,930. MODIFIED CROSSLINKED POLYOXYMETHYLENES AND THEIR PREPARATION.

3,560,676. EXTRACTING DEVICE FOR APPARATUSES.

3,562,733. ELECTRIC CIRCUIT BREAKER WITH IMPROVED TRIP ALARM.

3,605,051. AVOIDANCE OF SWITCHING DEVICE FALSE OFF HANDLE INDICATION.

3,636,410. AUTOMATIC MOLDED CASE CIRCUIT BREAKER WITH TIME-DELAY OVERCURRENT TRIPPING.

3,657,604. SHOCK PROTECTION DEVICE CIRCUIT.

3,735,309. VAPOR-STATE LIMITER WITH HIGH PRESSURE HOUSING.

3,769,549. ELECTRICAL FIRE AND SHOCK PROTECTIVE APPARATUS.

3,769,551. CIRCUIT BREAKER WITH HEAT PIPE COOLING MEANS.

3,795,841. SHOCK PROTECTING CIRCUIT BREAKER FOR TWO CIRCUITS WITH COMMON NEUTRAL.

3,806,855. VAPOR STATE CURRENT LIMITING DEVICE.

3,813,619. CURRENT-LIMITING CIRCUIT BREAKER.

3,849,752. CURRENT RESPONSIVE ACTUATOR.

3,864,005. RESILIENT ELECTRICAL TERMINAL CONNECTOR.

3,869,649. ELECTRICAL PROTECTIVE PANEL ASSEMBLY WITH SENSITIVE GROUND FAULT PROTECTING MEANS.

3,872,355. FIRE DETECTION AND PROTECTION CIRCUIT AND DEVICE.

3,873,791. CURRENT LIMITING CIRCUIT BREAKER.

3,873,887. ALTERNATING-CURRENT POWER DELIVERY SYSTEM.

3,888,560. ELECTRICAL TERMINAL CONFIGURATION.

3,902,002. GROUNDING ATTACHMENT FOR NONMETALLIC ENCLOSURES.

3,935,409. CURRENT-LIMITING CIRCUIT BREAKER.

3,950,071. MULTIPLE STAB ELECTRICAL CONNECTOR.

3,986,152. NEGATIVE IMPEDANCE NETWORK.

Incomplete Copies of U.S. Patent No. 4,085,105

In printing copies of U.S. Patent No. 4,085,105 granted April 18, 1978, the last page was inadvertently omitted. Copies of the missing page will be supplied upon request addressed to the Patent Trademark Office:

Commissioner of Patents and Trademarks
United State Patent and Trademark Office
Customer Services Division
Washington, D.C. 20231

Please furnish the mailing address to which copies of the missing page should be sent.

Errata

All reference to Patent No. 4,097,211 to Thomas W. Springs and William F. Wallis of Michigan for Noise Suppression Structure for Block Making Machinery appearing in the OFFICIAL GAZETTE of June 27, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,097,622 to Lewis I. Sitkin of Pennsylvania for Process for Surface Treating Cupreous Based Alloy Ingots appearing in the OFFICIAL GAZETTE of June 27, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,100,279 to Rolf Gericke, Werner Rogalski, Rolf Bergmann and Helmut Wahlig of Germany for 7(2(4-Oxo-Pyridyl) Acetamido)-3-Heterocyclic Thio-Cephalosporin Derivatives appearing in the OFFICIAL GAZETTE of July 11, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,104,001 to Morris R. Jeppson of California for Microwave Method and Apparatus for Reprocessing Pavements appearing in the OFFICIAL GAZETTE of August 1, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,105,497, to Charles Ronald Musick of Connecticut for System and Process for the Control of a Nuclear Power System appearing in the OFFICIAL GAZETTE of August 8, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,105,706 to Samuel A. Tabak and Roger A. Morrison of New Jersey for Vapor Phase Isomerization of Methyl-Substituted Aromatic Hydrocarbons Improved by Using Highly Diluted Zeolite Catalyst appearing in the OFFICIAL GAZETTE of August 8, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,105,870 to Herman P. Miller, III of California for Narrow Band Transmission System and Method appearing in the OFFICIAL GAZETTE of August 8, 1978 should be deleted since no patent was granted.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 773,363. System for Thermal Energy Storage Space, Heating and Cooling and Power Conversion. Filed Mar. 1, 1977.

Patent application 776,384. Scanning System. Filed Mar. 10, 1977.

Patent application 787,130. Cable Fed KrF Laser. Filed Apr. 13, 1977.

Patent application 787,417. Fast Helical Pin Laser. Filed Apr. 14, 1977.

Patent application 792,280. Method and Apparatus for Producing Laser Radiation Following Two-Photon Excitation of a Gaseous Medium. Filed Apr. 29, 1977.

Patent 4,043,192. Apparatus for Providing Directional Permeability Measurements in Subterranean Earth Formations. Filed June 8, 1976. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,043,671. Laser System Preset Unit. Filed July 13, 1976. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,043,890. Device for Measuring the Total Concentration of Oxygen in Gases. Filed June 14, 1976. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,044,752. Solar Collector With Altitude Tracking. Filed Aug. 1, 1975. Patented Aug. 30, 1977. Not available NTIS.

Patent 4,044,819. Hydride Heat Pump. Filed Feb. 12, 1976. Patented Aug. 30, 1977. Not available NTIS.

Patent 4,045,724. Electromagnetic Wave Method for Mapping Subterranean Earth Formations. Filed Apr. 6, 1976. Patented Aug. 30, 1977. Not available NTIS.

Patent 4,046,666. Device for Providing High-Intensity Ion or Electron Beam. Filed May 7, 1976. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,048,437. Superconducting Magnet Cooling System. Filed June 6, 1975. Patented Sept. 13, 1977. Not available NTIS.

Patent 4,049,515. Laser Isotope Separation by Multiple Photon Absorption. Filed Apr. 22, 1975. Patented Sept. 20, 1977. Not available NTIS.

Patent 4,051,202. Method for Separating Mono- and Di-Octylphenyl Phosphoric Acid Esters. Filed Nov. 17, 1975. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,053,763. Method and Apparatus for Pulse Stacking. Filed May 25, 1976. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,053,851. Near 16 Micron CO Sub 2 Laser System. Filed July 10, 1975. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,053,852. Method and Apparatus for Generating Coherent Near 14 and Near 16 Micron Radiation. Filed July 10, 1975. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,054,933. Saturating Time-Delay Transformer for Overcurrent Protection. Filed Dec. 18, 1975. Patented Oct. 18, 1977. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel, for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent application 664,091. Multispectral Imaging and Analysis System. Filed Mar. 5, 1976.

Patent application 774,384. Automatic Communication Signal Monitoring System. Filed Mar. 4, 1977.

Patent application 828,262. High-Torque Open-End Wrench. Filed Aug. 29, 1977.

Patent application 860,405. High Toughness-High Strength Iron Alloy. Filed Dec. 13, 1977.

Patent application 876,431. Module Failure Isolation Circuit for Paralleled Inverters. Filed Feb. 9, 1978.

Patent application 876,438. A Prosthesis Coupling. Filed Feb. 9, 1978.

Patent application 878,541. Improved Base Drive for Paralleled Inverter Systems. Filed Feb. 16, 1978.

Patent application 880,726. Wind Wheel Electric Power Generator. Filed Feb. 24, 1978.

Patent application 880,727. Biocontamination and Particulate Detection System. Filed Feb. 24, 1978.

Patent application 880,728. A Solium Storage and Injection System. Filed Feb. 24, 1978.

Patent application 880,729. Velocity Servo for Continuous Scan Fourier Interference Spectrometer. Filed Feb. 24, 1978.

Patent application 883,090. Kine-Pak: A Self-Contained, Electrical Power Generator System. Filed Mar. 3, 1978.

Patent application 883,961. Catalysts for Imide Formation From Aromatic Isocyanates and Aromatic Diaphydrides. Filed Feb. 24, 1978.

Patent application 885,067. System for Automatically Switching Transformer Coupled Lines. Filed Mar. 9, 1978.

Patent application 889,671. Partial Interlaminar Separation System for Composites. Filed Mar. 24, 1978.

Patent application 891,243. Double-Sided Solar Cell Package. Filed Mar. 29, 1978.

Patent application 891,373. Liquid Reactant Feeder for Arc Assisted Metal Reduction Reactor. Filed Mar. 29, 1978.

Patent application 891,872. Synthesis of Multifunction Triaryltrifluoroethanes. Filed Mar. 30, 1978.

Patent application 891,875. Synthesis of Multifunction Triaryltrifluoroethanes. Filed Mar. 30, 1978.

Patent application 893,382. Fluid Sample Collection and Distribution System. Filed Apr. 4, 1978. Not available NTIS.

Patent application 893,648. Water Quality Monitoring System. Filed Apr. 4, 1978.

Patent application 893,857. Method for Alleviating Thermal Stress Damage in Laminates. Filed Apr. 6, 1978.

Patent application 893,903. Redundent Operation of Counter Modules. Filed Apr. 4, 1978.

Patent application 897,828. Sweat Collection Capsule. Filed Apr. 19, 1978.

Patent application 879,840. Penetrator Nozzle. Filed Apr. 19, 1978.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent 3,693,440. Electromagnetic Flowmeter. Filed Mar. 21, 1969. Patented Sept. 26, 1972. Not available NTIS.

Patent 4,088,387. Optical Switch. Filed Feb. 22, 1977. Patented May 9, 1978.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Services
Div., Federal Bldg., Agricultural Research Service
Hyattsville, Md. 20782

Patent application 787,177. Antibacterial Textile Finishes Utilizing Zirconyl Acetate Complexes of Inorganic Peroxides. Filed Apr. 15, 1977.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 12, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-12-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-6-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-19-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-28-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-23-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-18-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-24-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors: Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-2-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-8-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-24-77

Expiration of patents: The patents within the range of numbers indicated below expire during August 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,994,087 to 2,998,605, inclusive
Plant Patents..... Numbers 2,085 to 2,094, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED SEPTEMBER 5, 1978

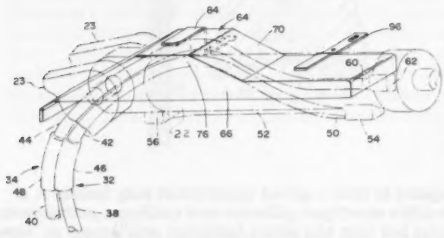
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T974,001
GUARD FOR TILT CYLINDER HOSES AND FITTINGS

James G. Neal, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 7, 1977, Ser. No. 813,727
Int. Cl.[2] E02F *3/70*
U.S. Cl. 214—140
3 Sheets Drawing. 7 Pages Specification



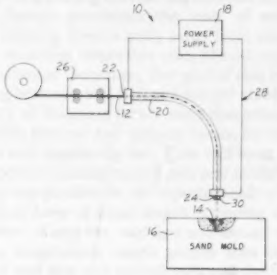
A loader vehicle having a frame including an ear, a tilt cylinder, having one end extending along one side of the ear, and pivotally connected thereto, for tilting a bucket, hydraulic hoses and fittings extending alongside the cylinder to supply hydraulic fluid thereto, and a guard for the hoses and fittings. The guard includes an inverted U-shaped cover extending over the hoses up to the ear, a plate cover segment narrower than and extending from the U-shaped cover along the other side of the ear to protect the fittings, and a plurality of brackets which connect the U-shaped cover to the tilt cylinder.

T974,002
APPARATUS AND METHOD FOR ELECTRICALLY HEATING A MOVING WIRE CONTAINING TREATING AGENTS

Bruce T. Blatzer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 25, 1977, Ser. No. 855,036
Int. Cl.[2] C21D *9/62*
U.S. Cl. 219—155
1 Sheets Drawing. 7 Pages Specification

An apparatus electrically heats a wire containing treating agents to a preselected temperature while controllably passing the heated wire into molten metal of a mold. The apparatus includes an insulated guide tube which has inlet and outlet contact orifices and wire feed apparatus for urging the wire through the guide tube at a preselected rate. A power supply is connected to the inlet and outlet contact orifices and the wire is in contact with the inlet and outlet orifices and forms an electric circuit. The circuit delivers electric current to the wire of a magnitude sufficient for increasing the temperature of the wire to a preselected temperature at the outlet orifices prior to entry of the wire into the molten metal.



A method of heating the moving wire prior to entry of the wire into molten metal of a mold is provided by connecting the power supply to the wire and forming the electric circuit, urging the wire through the circuit and into the mold at a preselected rate, and heating the wire to a preselected temperature by passing electric current of a preselected magnitude through the circuit.

T974,003
CURE ACCELERATOR FOR POLYSULFIDE POLYMER BASED SEALANTS

Edward G. Millen, 246 Cold Soil Rd., Princeton, N.J. 08540

Filed Mar. 27, 1978, Ser. No. 890,432
Int. Cl.[2] C08F *28/00*
U.S. Cl. 528—374
No Drawing. 8 Pages Specification

Cure rate of liquid polysulfide polymer based sealants may be accelerated by incorporation of tetramethylene sulfone therein. This is particularly of importance in one part sealants cured by ZnO_2.

REISSUES

SEPTEMBER 5, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,750

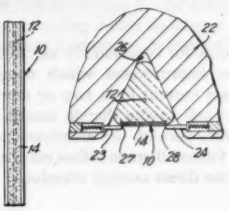
CLINICAL GLASS THERMOMETER HAVING A STEM AND A BULB INTEGRALLY FORMED THEREWITH

Seymour N. Blackman, c/o Premo Pharmaceutical Laboratories, Inc., 111 Leuning St., S. Hackensack, N.J. 07606

Original No. 4,014,215, dated Mar. 29, 1977, Ser. No. 549,325, Feb. 12, 1975. Division of Ser. No. 453,324, Mar. 21, 1974, Pat. No. 3,884,666, which is a continuation-in-part of Ser. No. 219,308, Jan. 20, 1972, abandoned. Application for reissue Apr. 22, 1977, Ser. No. 789,794

Int. Cl.[2] G01K *5/02*

U.S. Cl. 73—371 **2 Claims**



1. A clinical glass thermometer having a stem of triangular cross-section, a capillary bore extending lengthwise within said stem, an opaque strip embedded within said stem and extending longitudinally thereof, and a bulb of circular cross-section, said bulb having side walls and a bottom wall formed integrally with said stem from a single piece of glass, a portion of said opaque strip extending into a side wall of said bulb, said portion of said strip in said side wall being a straight continuation of the balance of said strip in said stem, said side walls of said bulb having a thickness approximately equal to the thickness of said bottom wall, said side walls of said bulb joining said stem with no abrupt reduction of wall thickness.

Re. 29,751

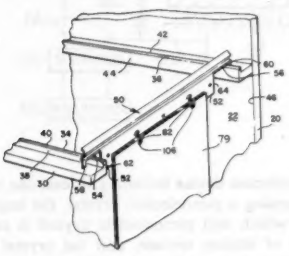
MEANS FOR FILING DOCUMENTS

Abram G. Elias, 3300 Skyline Blvd., No. 205, Reno, Nev. 89510, and Peter G. Elias, 6 Wedgewood Dr., Winnipeg, Manitoba, Canada (R3T 2J8)

Original No. 3,850,488, dated Nov. 26, 1974, Ser. No. 327,743, Jan. 29, 1973. Continuation-in-part of Ser. No. 238,040, Mar. 27, 1972, abandoned. Application for reissue Oct. 26, 1976, Ser. No. 735,100

Int. Cl.[2] A47B *63/00*

U.S. Cl. 312—184 **13 Claims**



1. Document filing apparatus, comprising:

a frame including rail support means and first and second elongated substantially horizontally-disposed rails each being of equal width and each having opposite inner and outer sides, said first and second rails being disposed in horizontal spaced-apart relationship with said inner sides of said rails facing each other; and

a plurality of elongated document-supporting bars each having a load carrying upper portion and a document carrying lower portion, each said upper portion extending the full length of said bar and being generally concavo-convex in cross section to provide supporting strength for said bar and to provide a relatively compact horizontal nesting relationship with other like bars positioned adjacent to each other, said lower portion being generally planar in configuration with an upper boundary thereof affixed to a lower boundary of said upper portion, *each of* said [lower portion] *bars* having first and second notches formed therein proximate the ends of said bar, said notches opening downwardly away from said upper portion for receiving respective ones of said rails when said bar is positioned thereupon, that part of said lower portion extending between said first and second notches including a plurality of fastening means each comprised of an integral flexible fastener and opening means for affixing documents to said supporting bar, [the end-most parts of said lower portion forming stops] *first and second downwardly extending stop portions on the respective ends of the bar, said stop portions being* of equal length extending in a direction longitudinal of said bar, said first and second notches each having a longitudinal length greater than the combined widths of said first and second rails and the length of one of said [stops] *stop portions* such that when said first end of said bar is raised, said bar may be moved in said longitudinal direction toward said second rail far enough that said one end may be lowered to clear said inner side of said first rail while said second notch is still engaged with said second rail, thus allowing said second notch to thereafter be disengaged from said second rail by longitudinal movement of said bar beneath said first rail and in a direction away from said second rail while said bar is tilted to an inclined position and said second end of said bar is raised slightly to clear said second rail wherein said flexible fastener and opening means includes an elongated strap having an enlarged head segment at one end *severed from said lower portion,* the other end of said strap remaining unsevered from said lower portion, the severed strap and head segment leaving a generally key-shaped opening in said lower portion whereby when said strap is used to form a loop for affixing documents to said supporting bar, said head segment may be locked within said opening by slipping said head segment through that part of the opening formerly occupied by the elongated portion of the strap.

Re. 29,752

GROUNDING CLIP FOR ELECTRICAL FIXTURES

Frank C. Jaconette, Jr., Trumbull, Conn., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

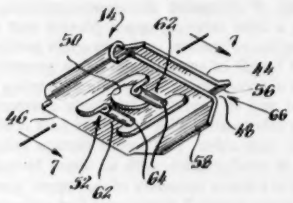
Original No. 3,810,069, dated May 7, 1974, Ser. No. 278,772, Aug. 8, 1972. Application for reissue May 5, 1976, Ser. No. 683,519

Int. Cl.[2] H01R *3/06*

U.S. Cl. 339—14 R **19 Claims**

1. A grounding clip for use with an electrical fixture of the type having a grounded mounting yoke by which the fixture is secured to a mounting box with mounting screws extending through slots in the mounting yoke, said grounding clip [comprising:] *consisting of* a U-shaped spring having a first member and a second member, said members being substantially flat

planar members, said members being separated by a gap of lesser magnitude than the thickness of the mounting yoke, said first member including an aperture, said second member including screw-receiving means aligned with said aperture for engaging a mounting screw, said screw-receiving means including a pair of cantilever arms, said grounding clip being mountable on the mounting yoke of the electrical fixture with said members forcibly bearing against the mounting yoke to



establish electrical continuity therebetween and with said aperture and said screw-receiving means aligned with one of the mounting yoke slots to receive a mounting screw, said cantilever arms being deflectable *and having ends which, in plan, follow straight-line paths at least in the regions where they contact the threads of the mounting screw* to slide over and forcibly abut against the threads of the mounting screw in maintaining electrical continuity therebetween as the mounting screw is axially engaged into said screw-receiving means.

Re. 29,753

ASBESTOS-FREE JOINT COMPOUNDS

Terrance L. Williams, Crystal Lake, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Original No. 3,891,453, dated Jun. 24, 1975, Ser. No. 382,973, Jul. 26, 1973. Application for reissue Dec. 27, 1976, Ser. No. 754,309

Int. Cl.[2] C04B *11/16*

U.S. Cl. 106—85 **12 Claims**

1. A composition which when mixed with water forms a non-leveling joint compound having properties suitable for use in finishing joints between wallboards [even when], *said composition being* free of asbestos fibers[,] *and* comprising the following ingredients in amounts based on the total dry weight of the composition:

a filler selected from the group consisting of calcium carbonate and calcium sulfate in an amount of between about 37 and 92 percent;

a binder in an amount of between about 1 and 7 percent;

attapulgus clay in an amount of between about 0.5 and 6 percent; and

at least one ingredient selected from the group consisting of;

a water-holding agent in an amount of between about 0.1 and 2.0 percent; and

a slip-inducing colloid in an amount of between about 0.1 and 2.0 percent selected from the group consisting of modified montmorillonite clay gel and xanthan gum,

said joint compound being characterized by having desirable working properties including non-leveling and slip properties which heretofore were achieved through the addition of asbestos and which properties are provided herein by substituting attapulgus clay to provide the pseudoplasticity necessary for obtaining said desired properties while avoiding the health hazards associated with the use of asbestos.

Re. 29,754

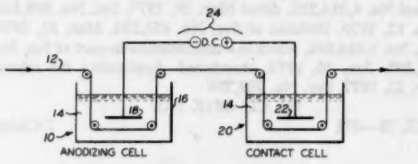
PROCESS AND APPARATUS FOR CONTINUOUSLY ANODIZING ALUMINUM

Howard A. Fromson, Rogues Ridge Rd., Weston, Conn. 06880

Original No. 3,865,700, dated Feb. 11, 1975, Ser. No. 361,720, May 18, 1973. Application for reissue Jan. 24, 1977, Ser. No. 762,085

Int. Cl.[2] C25D *7/06, 11/02, 11/04*

U.S. Cl. 204—28 **11 Claims**



2. In a process for continuously electrolytically anodizing aluminum, the improvement which comprises introducing anodizing direct current from two or more sources in a cathodic contact cell having therein anodes connected to said sources of direct current, the aluminum having an anodized oxide coating formed thereon before entering said cell through the action of the direct current introduced in the contact cell itself.

Re. 29,755

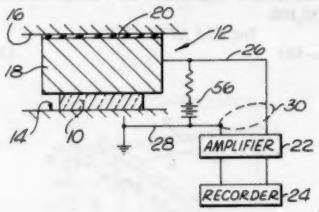
PIEZOELECTRIC TRANSDUCER HAVING A CRYSTAL ORIENTATION SELECTED FROM (XYL) + 31.7° (±1°) AND (XYL) + 76.7° (±1°) OR SYMMETRICAL EQUIVALENT

George D. Perkins, Los Angeles County, and John R. Colbert, San Diego County, both of Calif., assignors to Bell & Howell Company, Pasadena, Calif.

Original No. 3,735,161, dated May 22, 1973, Ser. No. 211,200, Dec. 23, 1971. Application for reissue Apr. 25, 1977, Ser. No. 790,513

Int. Cl.[2] H01L *41/18*

U.S. Cl. 310—329 **9 Claims**



1. In a piezoelectric device including at least one transducer element comprising a piezoelectric crystal, the improvement according to which said piezoelectric crystal is cut from a larger crystal of lithium niobate, said cut crystal having a crystal orientation selected from the following:

[(yxl) +38.6°(±1°), (zxtl) +60°(±1°)/+51.4°(±1°),] (xyl) +31.7°(±1°), (xyl) +76.7°(±1°), or a symmetrical equivalent thereof.

Re. 29,756

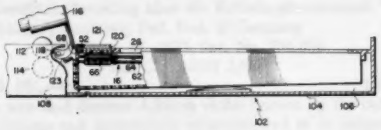
PHOTOGRAPHIC FILM ASSEMBLAGE AND APPARATUS

Nicholas Gold, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Original No. 3,748,984, dated Jul. 31, 1973, Ser. No. 213,989, Dec. 30, 1971. Application for reissue Jul. 2, 1976, Ser. No. 702,047

Int. Cl.[2] G03B *17/52*

U.S. Cl. 354—85 34 Claims



44. A photographic film assemblage for use with a photographic apparatus of the type including means defining a chamber into which said film assemblage is adapted to be inserted and means on the apparatus positioned adjacent a path of travel of a film assemblage being inserted into the chamber for opening an end cap associated with said film assemblage, said film assemblage comprising:

a film container having a withdrawal slot at one end thereof;

a plurality of film units within said container adapted to be extracted therefrom through said withdrawal slot;

end cap means coupled to said container for movement between a closed position, wherein said end cap means is in alignment with and in closing relation to said withdrawal slot, and an open position, wherein said end cap means is out of alignment with said withdrawal slot, said end cap means including a portion thereof configured to engage the end cap opening means on the apparatus for moving said end cap from said closed position to said open position in response to inserting said film assemblage into the chamber; and

a flexible opaque sheet positioned between said end cap means and said withdrawal slot for light sealing said withdrawal slot.

PLANT PATENTS

GRANTED SEPTEMBER 5, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,296
AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA", Isselburg, Fed. Rep. of Germany

Filed Apr. 12, 1977, Ser. No. 786,854
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct African violet known by the cultivar name Indiana and particularly characterized as to uniqueness by the combined characteristics of large pink flowers on strong upright stems, the first flash of flowers being on 6–8 stems with 5–7 additional stems therebelow with flowers at the bud stage; up to 12 non-dropping flowers on each stem; medium green leaves, and by its vigorous growth, with full flowering appearing in 8–10 weeks.

4,297
ROSE PLANT

Samuel McGredy, IV, Auckland, New Zealand, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Sep. 6, 1977, Ser. No. 830,478
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—28 1 Claim

1. The new and distinct variety of Floribunda bush rose plant substantially as herein illustrated and described, which is characterized most especially in its high resistance to mildew and in that the rich orange scarlet color of its blooms persists substantially without change from the opening of the bud until the petals fall, said blooms being double, with from about 35 to about 45 petals and from six to eight petaloids.

PATENTS

GRANTED SEP. 5, 1978

ERRATA

For CLASS	See PATENT NO.
036-002 R	4,110,845
137-435	4,110,849
405-131	4,110,988
405-248	4,110,989
405-014	4,110,990
405-157	4,110,991
405-147	4,110,992
405-228	4,110,993
405-158	4,110,994
060-469	4,111,003
060-276	4,111,010
029-243.51	4,111,080
353-078	4,111,149
237-001 A	4,111,259
400-208	4,111,293
137-557	4,111,342
366-338	4,111,402
219-497	4,111,443
350-189	4,111,558
085-009 R	4,111,580
408-110	4,111,588
422-026	4,111,654
422-124	4,111,655
422-048	4,111,659
423-008	4,111,660
422-117	4,111,661
422-231	4,111,662
422-191	4,111,663
422-017	4,111,830
422-012	4,111,831
521-030	4,111,856
528-226	4,111,857
521-025	4,111,858
521-033	4,111,859
521-084	4,111,860
521-123	4,111,861
521-055	4,111,862
521-063	4,111,863
521-117	4,111,864
521-137	4,111,865
521-053	4,111,866
528-229	4,111,906
528-361	4,111,908
528-123	4,111,909
528-196	4,111,910

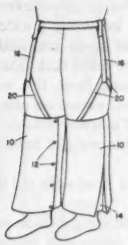
528–045	4,111,912
528–273	4,111,913
528–048	4,111,914
528–014	4,111,915
528–075	4,111,916
528–045	4,111,917
528–073	4,111,918
528–264	4,111,919
526–006	4,111,920
528–338	4,111,921
526–292	4,111,922
544–224	4,111,935
544–259	4,111,936
562–401	4,111,980
562–444	4,111,981
562–419	4,111,982
562–535	4,111,983
562–538	4,111,984
562–546	4,111,985
562–549	4,111,986
562–401	4,111,987
568–734	4,112,000
568–855	4,112,001
568–861	4,112,004
261–092	4,112,015
338–322	4,112,250
219–216	4,112,280
219–283	4,112,281
307–279	4,112,296
328–032	4,112,368
250–401	4,112,397
343–112 D	4,112,421
358–127	4,112,445

PATENTS

GRANTED SEPTEMBER 5, 1978

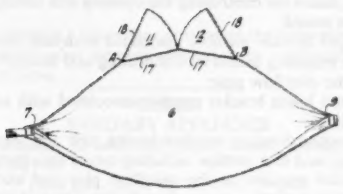
GENERAL AND MECHANICAL

4,110,845
RAIN CHAPES
Marge Chellis, 3388 Apache Ave., San Diego, Calif. 92117
Filed May 2, 1977, Ser. No. 792,763
Int. Cl.[2] A41D *17/00*
U.S. Cl. 36—2 R **1 Claim**



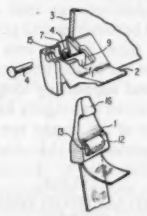
1. A rain chape being attachable to the leg in use and quickly removable and foldable into a mode occupying a minimum of space, said chape comprising:
   (a) a rectangular flexible sheet member;
   (b) said sheet member having a single vertical pleat therein traversing the height of the sheet and being stitched at the upper edge of the sheet and open at the bottom to permit the flaring of the lower edge of the sheet in use to cover the shoe, but also urging the pleat portion of the flexible sheet member into a flat-lying position for unbunched folding and storage;
   (c) a pair of straps attached to the upper edge of said sheet member on opposite sides of said pleat, said straps being angulated together and meeting at the top and therebeing joined by another strap having means for retaining same to the waist of a user, all of said straps lying in the same plane as said sheet member;
   (d) the vertical edges of said rectangular sheet member having mating fastening means to permit the fastening of the vertical edges together around the leg of a user to define a flared cylinder, whereby said chape can be engaged around the leg of a user and flare over the shoe to protect the leg and foot from rain, and between uses be folded into a minimum space due to the flat-lying nature and rectangular shape of the chape.

4,110,846
COMBINED SCARF AND HOOD
Robert Hernandez, 120 Andrews Ct., Turlock, Calif. 95380
Filed May 20, 1977, Ser. No. 799,115
Int. Cl.[2] A42B *1/04*
U.S. Cl. 2—203 **3 Claims**



1. A combined scarf and hood comprising a sheet of cloth originally of approximately triangular shape in plan providing three apices but truncated to sever one apex and provide a margin, a pair of hood panels of cloth, means for securing said hood panels to adjoin each other along a central seam, means for securing said adjoined hood panels to said sheet along said margin with said hood panels and said sheet forming a pocket for the user's head, a securing strap, means for securing one end of said strap to the second of said apices, a two-part fastening device, means for securing one part of said fastening device to the other end of said strap, and means for securing the other part of said fastening device to the third one of said apices.

4,110,847
QUICK FASTENING AND ADJUSTING SAFETY CLASP ESPECIALLY FOR SAFETY HELMETS
Alain Dera, Rueil-Malmaison, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France
Filed Jun. 2, 1977, Ser. No. 802,380
Claims priority, application France, Jun. 2, 1976, 76 16605
Int. Cl.[2] A42B *7/00*
U.S. Cl. 2—421 **5 Claims**



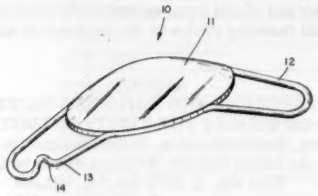
1. A rapidly attachable and adjustable safety buckle for a chin-strap of a protective helmet, comprising:
   a catch molded from rigid plastic and attached at one end to the outer wall of a helmet shell by means of a horizontal axis member allowing limited rotational movement of said catch, an inner face of said catch having a trapezoidal cavity, the sides of which converge towards the horizontal axis, and the outer face of which is pierced at right angles to the said point of convergence by an opening passing through the entire thickness of said catch; and
   a hook molded from rigid plastic, one end of which is attached to the chin-strap and the other end exhibiting a trapezoidal shape matching that of said cavity in said catch, the other end of the hook terminating in a protuberance fitting the opening which passes through said catch.

4,110,848
INTRAOCULAR LENS FOR IMPLANTATION INTO THE POSTERIOR CHAMBER OF A HUMAN EYE
Ronald P. Jensen, 4156 Dorset Pl., Pasadena, Calif. 91103, assignor to Ronald P. Jensen, Glendale, Calif.
Filed May 6, 1977, Ser. No. 794,467
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **4 Claims**

1. An intraocular lens for implantation in the posterior chamber of a human eye, said intraocular lens comprising:
   a. a plano-convex lens, which is formed from an optical material that is suitable for an implantable lens, which is adapted to be inserted into the posterior chamber of the human eye within the capsular membrane thereof;
   b. a first supporting loop, which is formed from a material that is suitable for implantation into the eye, mechanically coupled to the peripheral edge of said plano-convex lens and disposed at an angle in the range of 0° to 25° to the plane surface of said plano-convex lens so that its end

portion is below the plane surface of said plano-convex lens, said first supporting loop adapted to secure said plano-convex lens rigidly and permanently in the posterior chamber of the human eye; and

c. a second supporting loop, which is formed from a material that is suitable for implantation into the eye, mechanically coupled to the peripheral edge of said plano-convex lens and oppositely disposed to said first supporting loop, said second supporting loop being also disposed at an angle in



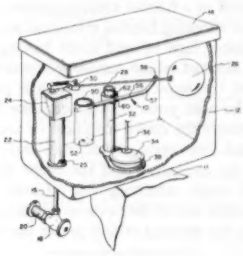
the range of 0° to 25° to the plane surface of said plano-convex lens so that its end portion is below the plane surface of said plano-convex lens and having a notch which is disposed between its end portion and the peripheral edge of said plano-convex lens so that a temporary securement to the iris of the human eye may be accomplished, said second supporting loop also adapted to secure said plano-convex lens rigidly and permanently in the posterior chamber of the human eye.

4,110,849

APPARATUS AND METHOD FOR CONSERVING WATER

Edward B. LaFaver, 3116 Maple Way, Granger, Utah 84119

Filed Mar. 7, 1977, Ser. No. 774,836
Int. Cl.[2] A47K *1/34, 5/02;* **A61B** *19/00*
U.S. Cl. 137—435 **8 Claims**



1. A water saver for a toilet tank having a water-supported toilet tank float mounted on a toilet tank float lever arm and operable therethrough to open a water inlet valve into the toilet tank upon lowering the toilet tank float from an elevated position by draining water from the toilet tank, the water saver comprising:

means for restraining the toilet tank float at an elevated position while water is draining from the toilet tank during flushing of the toilet comprising:

a water saver lever arm;

a water-fillable weight on one end of the water saver lever arm;

toilet tank float engagement means on the other end of the water saver lever arm;

pivot support means in the toilet tank for pivotally supporting the water saver lever arm at a position between the water-fillable weight on the one end of the water saver lever arm and the toilet tank float engagement means on the other end of the water saver lever arm; and

an aperture in the water-fillable weight to accommodate passage of water into and out of the water-fillable weight; and

means for releasing the toilet tank float after a major portion of the water has drained from the toilet tank.

7. A method for conserving water during a flushing cycle of a tank-type toilet by inhibiting inflow of water into the toilet tank during a substantial portion of the flushing cycle of the toilet comprising the steps of:

pivotally mounting a water saver lever arm inside the toilet tank, the toilet tank including a toilet tank float mounted on a toilet tank float lever arm and a water inlet valve operated through the toilet tank float lever arm by movement of the toilet tank float, the water saver lever arm having an engagement means on one end for engaging the toilet tank float and a water-fillable weight on the other end, the water-fillable weight having a small drain hole therein;

engaging the toilet tank float with the water saver lever arm engagement means;

filling the water-fillable weight with water;

conserving water by restricting inflow of water into the toilet tank from the water inlet valve while draining the toilet tank during flushing of the toilet by holding the toilet tank float above the diminishing water level in the toilet tank with the weight of the water in the water-fillable weight until a substantial portion of the water in the toilet tank has been drained therefrom; and

draining water from the water-fillable weight thereby decreasing the weight of the same to accommodate lowering of the toilet tank float and toilet tank float lever arm thereby opening the water inlet valve to allow the inflow of water into the toilet tank.

4,110,850

FLUSH VALVE ASSEMBLY

Thomas C. Tedei, 3015 Rose St., Franklin Park, Ill. 60131

Filed Jul. 21, 1977, Ser. No. 817,721
Int. Cl.[2] E03D *1/34, 5/02;* **A61B** *19/00*
U.S. Cl. 4—326 **8 Claims**

1. A flush valve assembly for a toilet tank having a drain valve positioned in the bottom wall thereof and an overflow pipe connected to the drain valve comprising:

an elongated valve body;

inlet means formed in said valve body;

valve means for controlling the opening and closing of said inlet means;

an upper bracket member associated with said valve body and including means for connecting said bracket member to the overflow pipe;

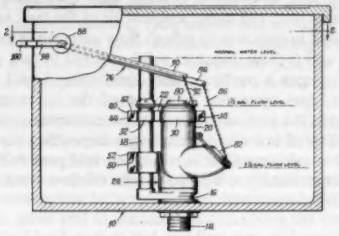
a second lower bracket member associated with said valve body;

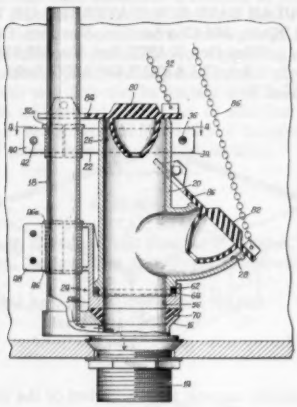
said second bracket member having first and second portions, said first portion including means for attaching said bracket member to the overflow pipe and said second portion including means for attaching to and supporting said valve body;

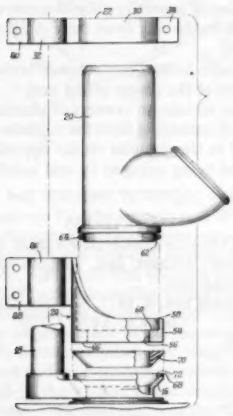
means defining an opening through said second portion of said second bracket member for establishing flush communication between said valve body and the drain valve;

cooperating means on the upper side of said second bracket

member and the lower end of said valve body for effecting a sealing engagement therebetween;







means defining a lower face portion on the underside of said second bracket member adapted to be positioned on the drain valve.

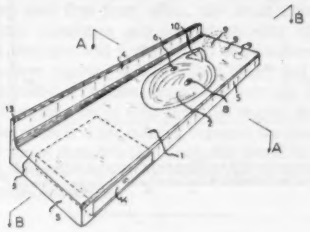
4,110,851

SANITARY APPLIANCE

Bernard Rapatel, 43 boulevard Ernest Renan, Firminy, Loire, France (42700)

Filed Dec. 15, 1976, Ser. No. 750,900
Int. Cl.[2] A47K *1/04;* E03C *1/18*
U.S. Cl. 4—166 **1 Claim**

1. A sanitary lavatory and vanity fixture combination of an integrally formed polyester reinforced with fiber glass construction comprising an elongated shelf top having a large vanity surface area, at least one ovoid basin integrally formed in said shelf and flush with said shelf top, said basin having a depth to provide a maximum water level for a minimum water depth, a first drain means and a second drain means in said basin where said first drain means is vertically below and in line with said second drain means, an overflow duct affixed to said basin for connecting said first drain means to said second drain means, said overflow duct having an outlet drain means, a raised wall means formed along one edge of the shelf top and having a longitudinal groove formed along an upper edge, a pair of opposited end wall means formed on opposite ends of said shelf, a front wall means formed on said shelf top opposite said raised wall means, said pair of opposited end wall means and said front wall means having a height measured from said shelf top which is greater than the depth of said basin measured from said shelf top, whereby said pair of opposited end wall means and said front wall means comprise a stable base for said fixture, at least two rigid reinforcing plate means for reinforcing said shelf top, said rigid reinforcing plate means being imbedded in the underside of said shelf means in a region adjacent said raised wall means, at least two supporting brackets bonded to said reinforcing plate means to form an integral unit with said rigid reinforcing plate means, each of said brackets being adapted for attachment to a vertical support, said fixture including tap elements connected to said shelf top in the region of said basin and a soap holder means incorporated beside said basin, said soap holder means being in a plane which is lower than that of the shelf top.



4,110,852

POOL STRUCTURE

Dennis D. Kline, 2148 W. Wood Dr., Phoenix, Ariz. 85029

Filed Oct. 28, 1977, Ser. No. 846,413
Int. Cl.[2] E04H *3/16, 3/18*
U.S. Cl. 4—172 **8 Claims**

1. A pool structure comprising:

(a) an enclosure including a bottom wall and an integral upstanding endless wall configured to define an upwardly opening pool compartment for containing water, said upstanding endless wall being of spaced double panel construction to provide an equipment compartment therein which endlessly surrounds said pool compartment;

(b) a first hydro-jet water distribution manifold within said equipment compartment and having a plurality of nozzles extending therefrom into said pool compartment below the water line thereof;

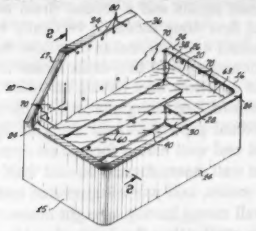
(c) a second hydro-jet water distribution manifold within said equipment compartment and having a plurality of nozzles extending therefrom into said pool compartment above the water line thereof;

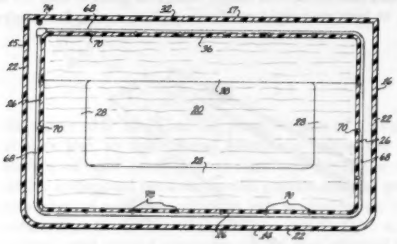
(d) a header mounted in said equipment compartment and coupled to said first and said second hydro-jet water distribution manifolds;

(e) means within said equipment compartment and coupled between said pool compartment and said header for drawing water from said pool compartment and supplying that water under pressure to said header; and

(f) means connected to said header and to said first and said

second hydro-jet water distribution manifolds for selectively supplying water under pressure from said header to





said first and said second hydro-jet water distribution manifolds.

4,110,853

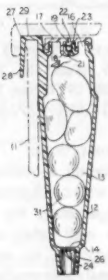
DISPENSING DEVICE

Luis dela Cruz, 5325 Bonita Dr., San Diego, Calif. 92114

Filed Aug. 29, 1977, Ser. No. 828,308

Int. Cl.[2] E03D *9/03*

U.S. Cl. 4—227 **3 Claims**



1. A device for dispensing in liquid form a normally solid purifying and disinfecting material, which device comprises:

a container defining a storage chamber;

a mounting means for detachably mounting the container within a toilet bowl tank;

said container having a port in its base communicating with said chamber, said container, mounting means and port being relatively dimensioned and positioned such that said port is disposed slightly above the lowest flush water level within a toilet bowl tank when said container is mounted in its normal operating mode;

a loading opening in the top of said container communicating with said chamber and including a cap detachably mounted in said opening;

a check valve disposed in the upper portion of said container and communicating with said chamber and being disposed above the uppermost water level in said toilet bowl tank, said check valve comprising a ball located vertically above and blocking a passage that communicates the chamber with the upper ambient air of the tank and being actuated in response to a flush flow entering through said port which flow dissolves solid material in said chamber and releases a purifying and disinfecting liquid into the toilet bowl upon the emptying of the toilet tank; and

wherein the port in the base of the container comprises a plurality of holes and including a depending conduit affixed to said container surrounding said port and extending downwardly to a position near the low water level in said toilet bowl tank.

4,110,854

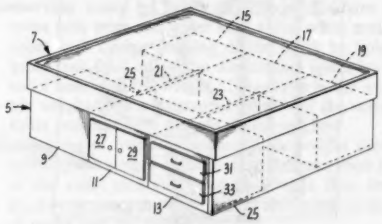
MODULAR BASE FOR WATERBED OR THE LIKE

Robert H. Sjolie, 346 Charcot Ave., San Jose, Calif. 95131

Filed Oct. 3, 1977, Ser. No. 838,818

Int. Cl.[2] A47C *7/00*; A47G *9/00*

U.S. Cl. 5—2 R **5 Claims**



1. A modular support for a waterbed or the like comprising in combination:

a. six modules of generally cubical construction arranged in two rows and having front faces defining the sides of the waterbed;

b. an essentially hollow center space between the two rows of modules at the center of the bed;

c. notches at all interior corners of abutting modules;

d. two boards extending from the modules on one side of the waterbed to the modules on the opposite side of the waterbed and being engaged by said notches.

4,110,855

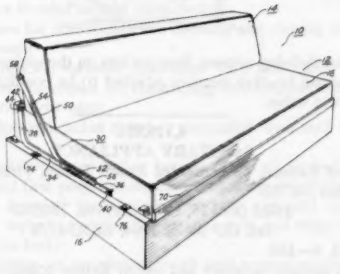
CONVERTIBLE SOFA-BED UNIT

Donald J. Acker, Elkhart, Ind., assignor to J.F. Enterprises, Inc., Wakarusa, Ind.

Filed Sep. 8, 1977, Ser. No. 831,606

Int. Cl.[2] A47C *17/00*

U.S. Cl. 5—45 **10 Claims**



1. A convertible sofa-bed unit comprising an elongated, horizontal seat section having a supporting frame for a seat, a

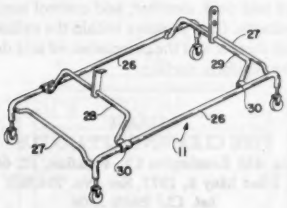
back section being substantially the same length as said seat section and positioned vertically upwardly from the rear of said seat section and being movable from said position to a horizontal position along the forward edge of said seat section, an operating mechanism at each end of said sections interconnecting said sections, each mechanism including a first arm having a member in a generally horizontal position pivotally connected to the end of said seat section toward the forward edge thereof and a member in a generally vertical position rigidly connected at one end to the rear end of said first member and pivotally connected at the other end to the lower portion of the respective end of said back section, a second arm connected at one end to the end of said seat section rearwardly from the connection between the seat section and said first arm and at the other end to the back section above the connection between said back section and said first arm, said arms pivoting forwardly with said back section to a position at which said arms are in a generally horizontal position, and a support means for said first arm connected to the frame of said seat section near the forward edge thereof for supporting said back section in a horizontal position along the forward edge of said seat section, with said first arm in contact with said support means and with said pivotal connection of said first arm and said back section being disposed forwardly of the pivotal connection of said second arm and said back section.

4,110,856

HOSPITAL BED

Roland A. Benoit, Danielson, and Edmond P. Guillot, Putnam, both of Conn., assignors to InterRoyal Corporation, New York, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,043
Int. Cl.² A61G *7/10*
U.S. Cl. 5—68 **17 Claims**



1. In a hospital bed described in upright orientation and operable with at least one IV-tube support rod, the bed including an upper frame for supporting a mattress, said upper frame having opposite head-end and foot-end sections and an intermediate thigh section, which sections are each tiltable relative to the others, said bed further including means for tilting each section, and a middle frame for pivotally supporting said upper frame sections, the improvement in combinations therewith wherein said middle frame comprises two longitudinal beams having head and foot ends corresponding to said upper frame ends, said head-end of the middle frame comprising a "U" shaped tubular member, with the bottom of the "U" extending transverse of and fixed to the head ends of said beams, and the arms of the "U" extending generally upward, each arm of the "U" including an opening for receiving and holding in the bore thereof said IV-tube support rod.

4,110,857

RESILIENT FOAM CUSHION STRUCTURE

Peter George Banister, Lake Elmo, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Jun. 21, 1976, Ser. No. 698,428
Int. Cl.² A47C *27/15;* A47G *9/00;* A61G *7/06*
U.S. Cl. 5—337 **9 Claims**

1. A resilient foam cushion structure comprising at least two pairs of foam sheets, each said pair comprising first and second foam sheets of substantially uniform thickness, a first plurality of spaced protuberances of a predetermined height extending from one face of each said first sheet and aligned depressions in the other face thereof, said first plurality of protuberances having substantially flat regions in a plane parallel to said first foam sheet, said second foam sheet having a second plurality of spaced protuberances of substantially said predetermined height extending from one face thereof and aligned depressions in the other face thereof, said second plurality of protuberances having substantially flat regions in a plane parallel to said second foam sheet, said first plurality of protuberances facing

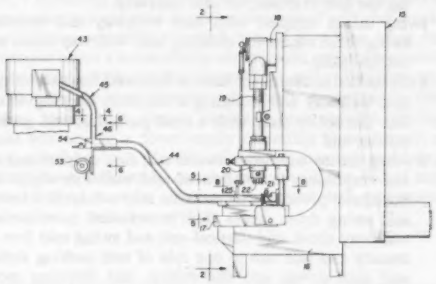
said second foam sheet and said second plurality of protuberances facing said first foam sheet, the arrangement of said protuberances permitting said second plurality of protuberances to fit between said first plurality of protuberances with their flat regions abutting said first foam sheet, and permitting said first plurality of protuberances to fit between said second plurality of protuberances with their flat region abutting said second foam sheet and the spacing between the nearest points of at least some of the sidewalls of adjacent protuberances from said first and second plurality of protuberances being less than said predetermined height.

4,110,858

LOCK NUT FORMING APPARATUS

Jack R. Kerr, 2208 Irving Blvd., Dallas, Tex. 75207

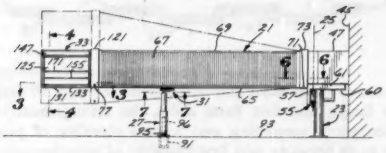
Filed Aug. 15, 1977, Ser. No. 824,342
Int. Cl.² B21D *53/24;* B21K *1/70*
U.S. Cl. 10—72 R **12 Claims**



1. Apparatus for forming lock nuts comprising
a reciprocating ram; a head on said ram carrying at least one punch; means for reciprocating said ram;
an axial feed track for guiding axially aligned nuts in a single transverse row under said ram punch, whereby one side wall of a nut is engaged by said punch; said axial feed track being disposed for gravity feed of the nuts;
an ejector-stop mounted for reciprocating movement, in the plane of said row of nuts, under said ram and transverse to said row; means for reciprocating said ejector-stop in synchronism with the reciprocation of said ram; said ejector-stop being effective as an ejector to displace at least one lead nut from said row, and being effective simultaneously as a nut stop to stop axial movement of the following nuts in said row;
a lateral feed track disposed for gravity feed of a row of side-by-side nuts to said axial feed track;
a feed transfer speed coupler connecting the outlet of said lateral feed track and the inlet of said axial feed track; said speed coupler converting the lateral gravity feed of nuts

to axial feed of nuts; a vibrator mounted for vibrating said speed coupler and said axial feed track; and air jet means associated with said speed coupler for directing jets of air against one face of a nut therein to urge initial axial feed of the nut into said axial feed track.

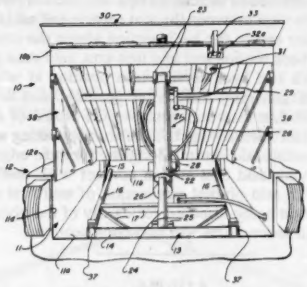
4,110,859
PASSENGER LOADING RAMP
Robert D. Lichti, 3318 Warwood Rd., Lakewood, Calif. 90712
Filed Nov. 7, 1977, Ser. No. 849,502
Int. Cl.[2] E01D *1/00*
U.S. Cl. 14—71.5 **13 Claims**



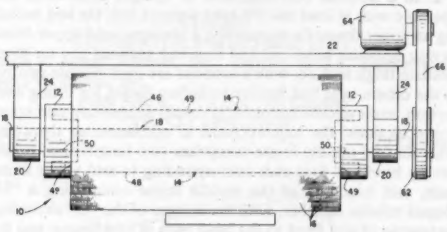
1. A passenger loading ramp for transferring passengers between a terminal and a craft at a parking station spaced a selected distance therefrom and comprising:
- a first support adjacent said terminal;
- a second support disposed intermediate said first support and said parking station;
- a rigid walkway projecting from said first support, over said second support and to said selected location;
- cover means covering said walkway;
- mounting means for mounting one end of said walkway from said first support and including vertical and horizontal pivot means for pivoting about respective vertical and horizontal axes;
- elevating means on said second support for pivoting said walkway about said horizontal axis for raising and lowering the free extremity of said walkway;
- swing means coupled with said walkway and including swing drive means for pivoting said walkway about said vertical axis;
- a cab carried in cantilever fashion from said free extremity of said walkway and including a doorway opening to one side thereof to mate with a craft parked at said parking station; and
- leveling means coupled between said first support and cab and responsive to rotation of said walkway about said horizontal pivot axis to maintain said cab level whereby said swing drive means may be actuated to rotate said walkway about said vertical axis and swing said free extremity and said cab to one side of said parking station, said craft driven into said station, said elevating means actuated to pivot said walkway about said horizontal axis to adjust said cab to the desired level for said craft and said swing drive actuated to swing the free extremity of said walkway toward said craft to mate therewith.

4,110,860
LEVELER ASSEMBLY FOR A LOADING DOCK
Robert O. Neff, Milwaukee; Lynn O. Grunwald, Cudahy; Roderick B. Potter, Milwaukee, and Norbert Hahn, Cudahy, all of Wis., assignors to Rite-Hite Corporation, Cudahy, Wis.
Filed Jul. 26, 1977, Ser. No. 819,046
Int. Cl.[2] B65G *69/24*
U.S. Cl. 14—71.7 **7 Claims**

1. A leveler assembly for use within a pit formed in the platform surface of a loading dock, the pit having a base recessed from the platform surface, a rear wall, an open top, and an open front side adjacent the front of the loading dock; said leveler assembly comprising a stationary frame adapted to be anchored within the pit, said frame having a front section positionable adjacent the pit open front side and recessed from the plane of the platform surface, and a rear section positionable adjacent the pit rear wall and having an elevated portion adapted to be disposed adjacent to but beneath the plane of the platform surface; a deck member hingedly mounted on the elevated portion of the frame rear section, the periphery of said deck member being adapted to conform substantially to the configuration of the pit open top, said deck member being adapted to normally assume a neutral position of hinged adjustment wherein the upper surface of said deck member is adapted to be substantially coplanar with the platform surface and a front edge of the upper surface is adjacent the pit open front side; a hydraulic piston-cylinder unit having an exposed piston end hingedly connected to said frame front section and a closed cylinder end hingedly connected to the underside of said deck member at a location spaced rearwardly a substantial distance from the front edge of said dock member wherein the piston-cylinder unit extends angularly upwardly and rearwardly from said frame front section for all positions of hinged adjustment of said deck member; said control means for regulating the hydraulic fluid pressure within the cylinder adjacent the closed end thereof and the orientation of said dock member relative to the platform surface.



4,110,861
TIRE CLEANING APPARATUS
Daniel Pecora, 456 Kensington Ct., Palatine, Ill. 60067
Filed May 6, 1977, Ser. No. 794,563
Int. Cl.[2] B60S *3/06*
U.S. Cl. 15—53 B **5 Claims**



1. An improved tire cleaning apparatus for a car wash facility, said apparatus comprising:
- a shaft;
- a pair of split end adapters each of said pair of adapters being coupled to said shaft, said split end adapters comprising a pair of semi-circular sections coupled together into a circular configuration by a pair of threaded bolts, said split end adapters frictionally engaging the shaft;
- core receiving means positioned within each of said pair of adapters;
- a core formed of two semi-circular sections coupled to the core receiving means of the pair of split end adapters;

a plurality of brush filament assemblies coupled to the core sections;

a plurality of retaining screws coupled to each pair of split end adapters and positioned to retain the core within the core receiving means; and

rotary motion means coupled to the shaft for imparting rotary motion thereto.

4,110,862

MACHINE FOR CLEANING OUTER SURFACE OF PIPES OF A MAINLINE

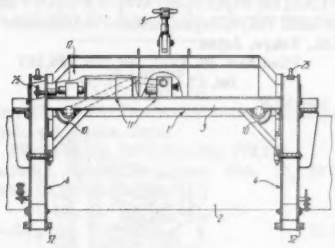
Vladimir Lukyanovich Buzhinsky, ulitsa Shafeeva 12/1, kv. 127; Konstantin Egorovich Raschepkin, ulitsa R. Zorge 37, kv. 67; Mikhail Grigorievich Dunjushkin, ulitsa R. Zorge 52/1, kv. 78; Gennady Tikhonovich Lysogorsky, prospekt Oktyabrya, 125, kv. 40; Rustem Ibragimovich Valeev, prospekt Oktyabrya 111/3, kv. 52; Yakov Arkadievich Nisenbaum, prospekt Oktyabrya 53, kv. 21, and Deviz Faizrakhmanovich Ikhsanov, ulitsa Tsjurupy 110, kv. 77, all of Ufa, U.S.S.R.

Filed Feb. 18, 1977, Ser. No. 770,033

Claims priority, application U.S.S.R., Feb. 23, 1976, 2331701

Int. Cl.[2] B08B 9/02

U.S. Cl. 15—88 **7 Claims**



1. Apparatus mountable on a pipeline for cleaning the outer surfaces of the pipeline comprising, a self-propelled carriage mountable on a pipeline having means for travelling axially on the pipeline for cleaning outer surfaces thereof, at least one hollow annular casing fixed to said carriage for travelling with said carriage axially of said pipeline, said casing comprising an upper half-ring connected to the carriage and a split, lower half-ring made of two parts each pivotally connected to the upper half-ring and having distal ends operable to a spaced apart position constituting an open position for accepting the pipeline therebetween when mounting the carriage on the pipeline and when dismounting the carriage and operable to a closed position enclosing the pipeline circumferentially, a rotor disposed in said casing for travelling therein circumferentially of the pipeline when the casing lower-ring is closed, said rotor including two half-rings, one of said rotor half-rings having distal ends operable to an open position with said casing lower half-ring and to a corresponding closed position, means for driving the rotor rotationally in said casing as said carriage travels axially of said pipeline, and said rotor having means for mounting cleaning tools angularly spaced thereon extending outwardly of said casing for engaging and cleaning the pipeline as said rotor travels circumferentially of said pipeline.

4,110,863

APPARATUS FOR CLEANING INNER SURFACES OF MOULDS

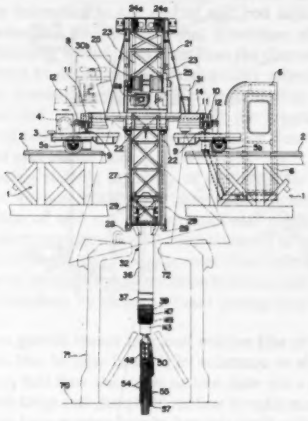
Shigeaki Fujimori, Hirakata; Shigekazu Hirata, Omihachiman, and Akira Kitamura, Osaka, all of Japan, assignors to Osaka Fuji Kogyo, Ltd., Amagasaki, Japan

Filed May 16, 1977, Ser. No. 797,378

Claims priority, application Japan, May 19, 1976, 51/58433

Int. Cl.[2] B08B 9/08

U.S. Cl. 15—104.1 C **3 Claims**



1. An apparatus for cleaning inner surfaces of moulds comprising a travelling deck for movement relative to moulds to be cleaned, a travelling club truck movably mounted on said deck for movement transverse to said movement of said travelling deck, a travelling truck movably mounted on said club truck for movement transverse to said movement of said club truck, a swivel ring rotatably mounted on said travelling truck for movement about a substantially vertical axis, means for swivelling said ring, guiding means mounted on said swivel ring, and an elongated cleaner assembly elevatably supported in said guiding means, said cleaner assembly comprising a driving means box having a downwardly extending cleaner body, a cleaner shaft having a plurality of cleaning members and being rotatably and oscillatably connected to the lower end of said cleaner body, means for rotating said cleaner shaft, and means for oscillating said cleaner shaft.

4,110,864

SWEEPER HOOD WITH TRANSVERSE AIR DUCT AND BROOM COMPARTMENTS

Arne Nils Gunnarsson, Upland, Calif., assignor to FMC Corporation, San Jose, Calif.

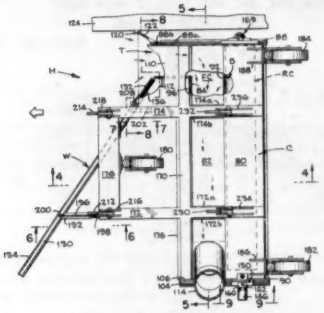
Filed Sep. 26, 1977, Ser. No. 836,647

Int. Cl.[2] E01H 1/08

U.S. Cl. 15—340 **11 Claims**

8. In a street sweeper or the like of the type having a mobile chassis, a debris hopper, a blower having its inlet connected to the hopper for exhausting air from the hopper, an elongate transverse hood, a driven rotatable cylindrical broom in said hood, an air and debris inlet port for the hood and a suction line connecting said hood to the hopper; the improvement in said hood wherein said hood comprises a main compartment having a top wall, depending front, rear and end walls that make sealing engagement with the swept surface, said hood having an intermediate transverse partition depending from said top wall to divide said main compartment into elongate, parallel front and rear transverse compartments, said front compartment comprising a transverse air stream duct that is substantially unobstructed along its length, said air and debris inlet port comprising a forwardly opening tunnel disposed at one

end of said duct, said suction line being connected to the other end of said duct for creating a uni-directional air stream along said duct, said broom being rotatably mounted in said rear compartment for dislodging debris from the swept surface and throwing it into said air stream, the lower edge of said partition stopping short of the swept surface for accommodating the generally horizontal passage of dislodged debris into the air stream, the top wall of said hood being imperforate along its



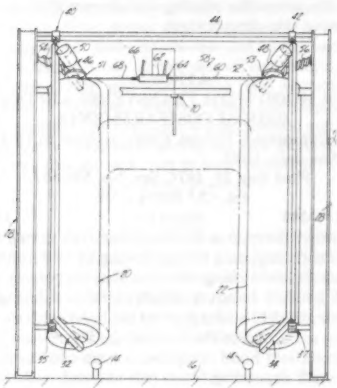
length up to said suction line, said tunnel having an outer side wall that is an extension of the end wall of said hood at said inlet port, a top wall, and an inner side wall that projects from the upstream edge of said air inlet port, an angled debris deflector projecting from the end of said outer tunnel side wall and an angled flexible inlet scoop projecting from the end of said inner tunnel side wall and laterally outwardly of the end wall of said hood at said inlet port for scooping up debris adjacent a curb or the like.

4,110,865

ADJUSTABLE WIDTH SIDE BRUSH ARRANGEMENT FOR LARGE VEHICLE WASHING MACHINES

David J. Bivens, Danville, Va., assignor to Bivens-Winchester Corporation, Ann Arbor, Mich.

Filed Mar. 7, 1977, Ser. No. 774,863
Int. Cl.[2] B60S *3/06*
U.S. Cl. 15—53 AB **10 Claims**



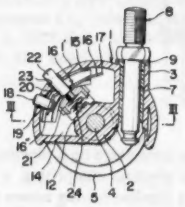
1. A vehicle washing machine comprising:
a machine frame defining an opening for receiving said vehicle;
a brushing system mounted to said machine frame and adapted to engage said vehicle upon passage of said vehicle therethrough, said brush system including a pair of said brushes disposed on either side of said opening;
brush support means supporting said side brushes so as to engage the vehicle sides as said vehicle passes through said opening said support means including a corresponding pair of swing frames mounting a respective brush in each of said swing frames for rotation about an axis thereon;
said support means further including means pivotally mounting each of said swing frames so as to swing into and out of said opening about a pivot axis parallel to said axis of rotation of said brushes
means drivingly connecting each of said swing frames to each other, said means being nonextensible under pressure exerted by said brushes, causing said swing frames to pivot together about each of said pivotal support means in a side-to-side movement to accommodate off-centering of said vehicle;
means for varying the length of said means drivingly connecting said swing frames, whereby said gap between said brushes may be adjusted and said vehicle washing machine is adapted to accommodate vehicles of varying widths while allowing centering side-to-side movment of said brushes.

4,110,866

CASTER EQUIPPED WITH A STOPPER

Hiroyuki Ishii, Tokyo, Japan, assignor to Sugatsune Industrial Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1977, Ser. No. 856,185
Int. Cl.[2] B60B *33/00*
U.S. Cl. 16—35 R **2 Claims**



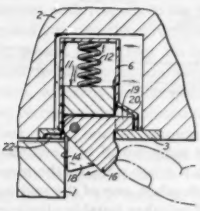
1. A caster equipped with a stopper, comprising:
a proper whose shell is formed into a substantially circular arc and which supports wheels through an axle,
a stopper piece which is provided at an inner end of said proper and which freely contacts with parts of said wheels so as to lock rotation of said wheels and to release the locking,
a lock pin which protrudes from a window provided in said proper,
a compression spring which is retained between said stopper piece and boss portions of said proper and whose elasticity urges said lock pin as an unlocking force,
a control piece which is provided with a lock hole for snugly and slidably inserting said lock pin therein, which is mounted at a desired inclination angle with respect to said lock pin and whose base end is fixed to said proper, and
a release pin which protrudes from a window provided in said proper and which, when pushed inwards, depresses a free end of said control piece.

4,110,867

RETRACTABLE DOOR STOP FOR BIDIRECTIONAL SWINGING DOOR

Joseph W. Gwozdz, Clark Summit, Pa., assignor to McKinney Manufacturing Company, Scranton, Pa.

Filed Nov. 14, 1977, Ser. No. 851,468
Int. Cl.[2] E05F 5/02
U.S. Cl. 16—82 8 Claims



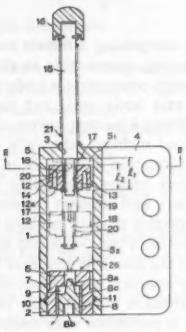
1. A retractable door stop for a bidirectional swinging door, comprising a faceplate for attachment to a door jamb and having inner and outer faces and an opening therethrough, a housing adapted to extend into a door jamb and having an open outer end engaging the inner face of the faceplate around said opening, a plunger slidably mounted in the housing and normally projecting from the outer face of the faceplate into door-stopping position, a spring in the housing behind the plunger normally holding the plunger in said position, the plunger having a laterally facing abutment for enagement by a door when closed in its normal closing direction, and a combination lever and latch pivotally connected to the plunger on a vertical axis and normally extending out of the faceplate opening for engagement by a finger to swing the lever toward the door side of the housing to simultaneously push the plunger rearwardly in said housing and move the latch into latching position, whereby to hold the plunger retracted until released by manually swinging the lever in the opposite direction.

4,110,868

AIR DAMPER

Yasutaka Imazaike, 8-22, Tanabenishino-cho, Higashisumiyoshi-ku, Osaka-shi, Osaka, Japan

Filed Feb. 18, 1977, Ser. No. 770,150
Claims priority, application Japan, Feb. 23, 1976, 51-20805 [U]; Feb. 23, 1976, 51-20806[U]
Int. Cl.[2] E05F 3/00, 5/10
U.S. Cl. 16—84 11 Claims



1. An air damper comprising:

a cylinder;

a rod slidably mounted in one end of said cylinder and projecting outwardly thereof;

a piston carried on said rod for reciprocation within said cylinder in sealing relation with the inner wall surface thereof and subdividing said cylinder into a first chamber outwardly of said piston and a second chamber inwardly thereof, said piston having an axially extending through bore dimensioned to accommodate movement of said rod therethrough;

air ports in said cylinder opening respectively into said first and second chambers;

means for retaining said piston on said rod permitting relative axial movement therebetween;

spring means for biasing said rod outwardly of said cylinder;

and a shoulder on said rod defining a section of reduced diameter extending to the end of said rod adjacent said piston reatining means, the radial dimension of said reduced diameter section being less than the diameter of the piston bore to define therewith an axially extending passageway normally establishing communication between said first and second chambers and the length of said section of reduced diameter being greater than the axial extent of said piston bore;

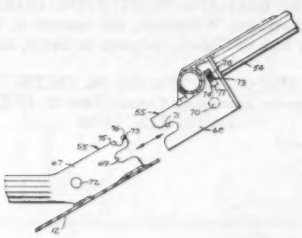
said rod being slidable inwardly of said cylinder so as to close the air port in said first chamber by positioning of the portion of said rod outwardly of said shoulder over said air port, movement of said rod inwardly of said cylinder also serving to effect engagement of said piston by said shoulder to prevent communication between said first and second chambers by closure of said passageway therebetween.

4,110,869

HANDLEBAR LATCHING MECHANISM FOR LAWN AND YARD IMPLEMENT

Paul F. Hastings, N. 5509 Market St., Spokane, Wash. 99207

Division of Ser. No. 716,132, Aug. 8, 1976. This application Oct. 17, 1977, Ser. No. 842,408
Int. Cl.[2] B62B 3/02, 5/06
U.S. Cl. 16—111 A 10 Claims



1. A handlebar latching mechanism for releasably attaching a handlebar to a lawn and yarn implement, comprising:

a first pair of slotted brackets adapted to be fixed to the implement;

a second pair of slotted brackets adpated to be fixed to the handlebar;

wherein the first and second slotted brackets mate in a releasable interlocking relationship;

wherein each bracket of one pair includes a pin projecting therefrom to be slidably received by a matching slot of a mating bracket of the opposed pair; and

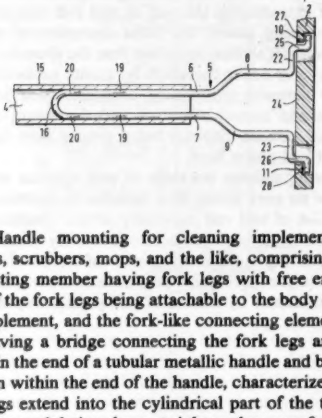
selectively releasable detent means for locking the mating brackets together.

4,110,870

HANDLE MOUNTING FOR CLEANING IMPLEMENTS

Georg Weihrauch, Wald-Michelbach, Odenwald, Fed. Rep. of Germany, assignor to Coronet-Werke Heinrich Schlerf GmbH, Fed. Rep. of Germany

Filed Mar. 8, 1977, Ser. No. 775,540
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1976, 2609903
Int. Cl.² A47B 95/02
U.S. Cl. 16—114 R 6 Claims



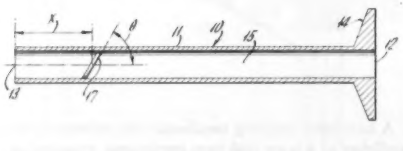
1. Handle mounting for cleaning implements, such as brooms, scrubbers, mops, and the like, comprising a fork-like connecting member having fork legs with free ends, the free ends of the fork legs being attachable to the body of the cleaning implement, and the fork-like connecting element additionally having a bridge connecting the fork legs and being inserted in the end of a tubular metallic handle and being fixed in position within the end of the handle, characterized in that the fork legs extend into the cylindrical part of the tube and are bent in an undulating shape at right angles away from the plane formed by the legs, wherein the apex of the bend of the fork legs on the one hand, and the bridge connecting the fork legs on the other hand, are supported on approximately opposite locations of the tube wall.

4,110,871

CORE EXCHANGING STUFFING HORN

Joseph G. Greenham, Willowdale, and Sanford A. B. Moore, Brampton, both of Canada, assignors to Devro, Inc., Somerville, N.J.

Filed Oct. 20, 1976, Ser. No. 734,226
Claims priority, application Canada, Oct. 20, 1975, 237988
Int. Cl.² A22C 11/00
U.S. Cl. 17—33 6 Claims



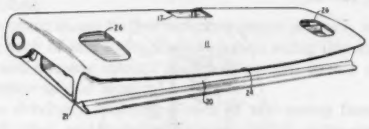
1. An improved sausage stuffing horn comprising an elongated body having an intake opening, a discharge opening and a confined channel for passage of flowing stuffing material connecting said openings; and a fixed deflecting member located in the confined channel but spaced inwardly from said discharge opening and lying at an angle between 5° and 85° as measured in the direction of flow of stuffing material, said deflecting member being capable of exchanging the inner portion of stuffing material with the outer portion of stuffing material as said stuffing material in the channel flows against said deflecting member.

4,110,872

MOULDED PLASTIC CLIP DEVICE

Peter Brian Gould, Normanhurst, Australia, assignor to Advance Industries Limited, New South Wales, Australia

Filed Jun. 2, 1977, Ser. No. 802,951
Int. Cl.² B42F 1/00
U.S. Cl. 24—67.11 2 Claims



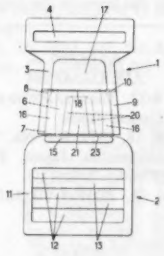
1. A clip device made up of two separable members, each member having on it a jaw portion, the members being pivotable relative to each other, one of the said members having on it a length of acetal or other suitable plastic material supported only by its ends and adapted to form a torsion bar, the other member being attached to the first in such a manner that the torsion bar portion is preloaded to bring the jaw portions into contact, one or both being provided with a portion to which finger pressure may be applied to separate the jaws against the torque of the torsion member.

4,110,873

COUPLING

Maurice Verchere, 1, rue de la Bretouze, 01103 Oyonnax, France

Filed Feb. 24, 1977, Ser. No. 771,584
Claims priority, application France, Mar. 31, 1976, 76 09401
Int. Cl.² A44B 17/00, 11/25
U.S. Cl. 24—230 R 5 Claims



1. A coupling comprising a female component and a male component releasably connectable to the female component, the male component comprising a body part and a projection extending from said body part, and the female component having means defining a passage having an open end to receive said projections and inclined side walls, said projection comprising a hook formation remote from said body part and resilient connecting means connecting said hook formation with said body part, said resilient connecting means comprising two lateral uprights slightly inclined toward each other so that their outer surfaces can cooperate with the inner surfaces of said passage of the female component for guiding said hook formation during insertion and connected at their upper ends by said hook formation whereby any lateral pivoting of the male component is prevented with respect to the female component, said hook formation having an abutment surface facing towards said body part and said female component having an abutment surface facing away from said open end of said passage, the dimensions and configuration of the male and female parts being complementary whereby the projection of the male component can be inserted in the passage of the female component, as far as an inserted position in which said abutment surface of the hook formation faces said abutment surface of

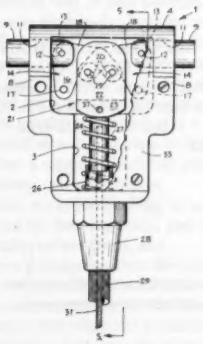
the female component to abut therewith for preventing withdrawal of the male component from said passage; said projection further comprising at least one rigid lug projecting from said body part and located between said two lateral uprights, the thickness of the lug in the direction perpendicular to the direction of insertion being substantially equal to the dimension of the said passage in the same direction, so that in the inserted position, the lug engaged in the passage prevents any pivoting of the male component with respect to the female component in a direction perpendicular to the direction of insertion, said resilient conneting means permitting resilient movement of said hook formation in said direction perpendicular to the direction of insertion, whereby, in the inserted position, said hook formation can be resiliently displaced out of register with the abutment surface on the famale component to allow withdrawal of the projection from said passage and whereby, during insertion, the hook formation can be resiliently displaced relative to said lug to allow the latter to enter said passage, before the hook formation springs into place behind said abutment on the female component.

4,110,874

RETRACTABLE PIN DISCONNECT

John A. Gaylord, San Diego, Calif., assignor to H. Koch & Sons, Inc., a division of Global Systems, a Gulf & Western Company, Anaheim, Calif.

Filed Oct. 19, 1977, Ser. No. 843,577
Int. Cl.[2] A44B *11/25*
U.S. Cl. 24—230 AS **7 Claims**



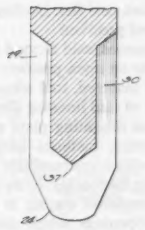
1. In a retractable pin disconnect
a hollow casing
one end of said hollow casing being adapted to accommodate a webbing thereover so as to confine the casing in folded portions of said webbing,
opposite retractable pins slidably extended through opposite side walls of said hollow casing,
a pair of bell cranks within said hollow casing,
means to connect each pin to the apex of the adjacent bell crank,
each bell crank being pivoted at its lower arm in the casing,
a lateral arm on each bell crank,
an actuating member,
means to connect the inner ends of the lateral arm of each bell crank to said actuating member,
resilient means to urge said actuating member toward said one end of said casing thereby to push said retractable pins out through said side walls into interlocking positions,
an element connected to said actuating member and extended through the other end of said casing and being manipulatable for pulling said actuating member against the action of said resilient means for retracting said pins from said interlocking positions.

4,110,875

SWAGED NEEDLE

Edson Perkins Foster, Cato, Wis., assignor to Foster Needle Company, Manitowoc, Wis.

Filed May 23, 1977, Ser. No. 799,484
Int. Cl.[2] D04H *18/00*
U.S. Cl. 28—115 **11 Claims**



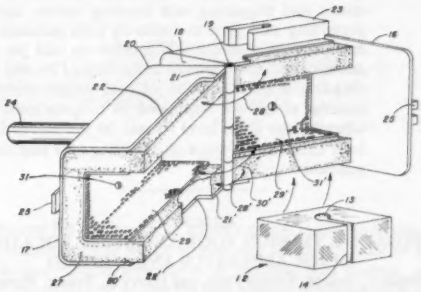
1. A felting needle having a blade portion preferably of circular cross section with a generally pointed forward end, the blade portion adjacent the forward end being generally "H" shaped in cross section and including two opposed faces, each face having a longitudinal groove therein, each groove disposed between a pair of spaced-apart, longitudinally-extending, radially outwardly-protruding ridges, a fiber receiving slot in the forward end of said blade, said slot being disposed in alignment with said opposed longitudinal grooves and defining a pair of points in the forward end.

4,110,876

JET MUFFLER

William Robert Weiss, Walnut Creek, Calif.; James Judson Cooksey, Colonial Heights, and Rob Roy Gordon, Jr., Suffolk, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Aug. 26, 1977, Ser. No. 828,053
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—271 **11 Claims**



1. In combination with a yarn treating jet for use in the production of a running length of multifilament, synthetic yarn, a muffler comprising:
A. a mounting plate;
B. a boxlike metal housing, said mounting plate fucntioning as a first face of said housing to form in conjunction therewith an enclosure for said jet, said housing having a second face which is opposite to said mounting plate and which has hinge means thereacross, and two of the other faces of said housing which are parallel to each other and intersect the axis of said hinge means at about each of the ends of said hinge means each having a slit therethrough which runs from the end of said hinge means to said mounting plate, each of said two other faces being cut

away at said slit to form an opening which is large enough for the passage of yarn therethrough and in register with one another, so that said housing can be opened and closed;

C. means for removably attaching said housing to said mounting plate;

D. handle means, said handle means being attached to said housing;

E. first latching means, said first latching means holding said housing in a closed position;

F. second latching means, said second latching means holding said housing in an open position;

G. sound absorbing material, said sound absorbing material lining the interior of said housing along the faces adjacent and normal to said mounting plate and said second face, said sound absorbing material having two slits therethrough each of which corresponds to one or said openings in one of said two other faces of said housing, said sound absorbing material mating at said slits to substantially close said openings when said housing is in said closed position, said yarn passing to and from said jet through said slits, the portion of said sound absorbing material closing said openings partially abrading when coming into contact with said yarn when said jet is operational;

H. two U-shaped perforated metal sheet retainers, each of said perforated metal sheet retainers having an open area of from 35 to 95 percent and functioning to retain said sound absorbing material against said faces of said housing which said sound absorbing material is lining, said perforated metal sheet retainers terminating at a point approximately corresponding to said openings in said two other faces of said housing so that when said housing is in said closed position said perforated metal sheet retainers have gaps therebetween which are of a width substantially similar to said openings; and

I. means for detachably securing said perforated metal sheet retainers to said housing so that said sound absorbing material is retained thereby;

whereby the noise level of said jet is reduced by:

(1) the enclosure of said jet by said muffler when said mounting plate and said housing are moved into said closed position, said enclosure resulting from moving said housing on said hinge means via said handle means and triggering said latching means, and (2) permitting said yarn to create its own entrance and exit passages through said muffler to said jet, said entrance and exit passages being formed by said yarn abrading a small portion of said sound absorbing material at said slit when said jet is operational, and whereby the noise level of said jet is reduced by at least 11.5ΔdB(A) when said housing is in said closed position.

4,110,877

FLOATING TENSION TOOL AND STRAP LOCATING GUIDE APPARATUS AND METHOD

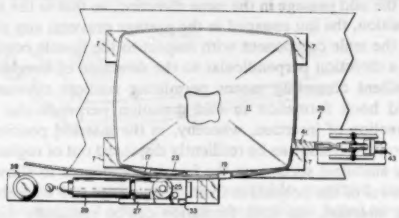
Donald L. Bracht, Seneca Falls, and Harry R. Swank, Waterloo, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jul. 1, 1977, Ser. No. 812,131
Int. Cl.² H01J 9/00
U.S. Cl. 29—25.13 **19 Claims**

1. An implosion-resistant cathode ray tube fabricating apparatus for a cathode ray tube having an envelope with a funnel portion and a viewing portion with a non-viewing region surrounded by an over-lapping loop of metal strapping, said apparatus comprising:

a support means for upholding said envelope in a predetermined positional location; and

a tightening means slidably affixed to said support means and including fixed and rotatable members with said rotatable member coupled to means operable to effect rotation, said fixed and rotatable members having means to receive said overlapping loop of metal strapping therebetween and operation of said rotational member exerting a force on and effecting movement in a given direction of one overlapping portion of said metal strapping and causing exertion of a substantially equal and opposite force on and



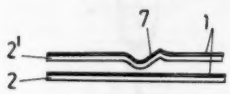
movement in a diametrically opposite direction of said tightening means and said other overlapping portion of said metal strapping whereby substantially equal tensional forces are exerted in opposite directions on said overlapping portions of said metal strapping.

4,110,878

METHOD FOR MANUFACTURING AN IMPREGNATED WOUND FOIL CAPACITOR

Kurt Wenzel, Larchenweg 6, A2751 Matzendorf, Austria

Filed Sep. 30, 1976, Ser. No. 728,028
Int. Cl.² H01G 4/22
U.S. Cl. 29—25.42 **3 Claims**



1. A method for the manufacture of a wound type foil capacitor comprising the steps of: forming a wound capacitor from two electrodes and a dielectric, the dielectric including at least two synthetic plastic foils, at least one of which is prestretched;

heating the wound capacitor to a temperature corresponding to the shrinking temperature of said at least one stretched foil, said at least one stretched foil being adjacent to the other foil, said other foil being at least shrunk to a lesser extent than said one foil within a shrinking range including said lesser extent up to a completely extended state; maintaining said wound capacitor at said temperature corresponding to the shrinking temperature of said at least one stretched foil until folds develop in said other foil;

compressing said wound capacitor up to 97% compressibility:

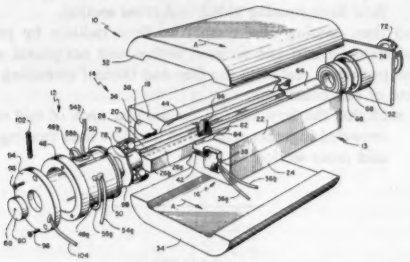
maintaining the compressed state of said wound capacitor during the shrinking process, and thereafter impregnating said wound capacitor with an impregnating fluid.

4,110,879

METHOD OF MAKING A LIMITED-ROTATION MOTOR WITH INTEGRAL DISPLACEMENT TRANSDUCER

Edward F. Burke, Jr., Reading, Mass., assignor to MFE Corporation, Salem, N.H.

Filed Apr. 8, 1977, Ser. No. 785,912
Int. Cl.[2] H01G *4/02, 4/40*
U.S. Cl. 29—25.42 **5 Claims**



1. The method of making a limited rotation motor of the type having a stator with stator pole pieces forming a generally cylindrical passage extending axially along the stator and an armature rotatively mounted in the passage and biased toward a reference position, said method comprising the steps of

A. forming an elongated bushing out of electrically conductive nonferromagnetic material, said bushing having a generally cylindrical inner surface whose radius is substantially the same as that of said passage,

B. forming lengthwise slots in the bushing so as to define at least one pair of arcuate tines extending from the bushing collar,

C. assembling the stator pole pieces and bushing so that the bushing is coaxial with the axis of said passage,

D. potting the pole pieces and bushing in a nonelectrically conductive material so as to maintain their spatial relationship and to define a single cylindrical passage extending through the bushing and pole pieces,

E. forming a circular cut in the bushing so as to separate the bushing tines from the bushing collar and from each other so as to electrically isolate them, and

F. honing the entire passage so that the separated bushing tines and pole pieces have the same radius all along said passage and are concentric with the passage axis over their entire areas so that when the armature is rotated, the differential capacitance between the plates and the armature accurately reflects the angular deviation of the armature from its reference position.

4,110,880

CABLE HARNESS ASSEMBLY AND ELECTRICAL TESTING MACHINE

Michael Seigman Peppler, Lancaster, and Johannes Cornelis Wilhelmus Bakermans, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 25, 1977, Ser. No. 772,204
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—33 K **10 Claims**

1. A cable harness assembly apparatus for terminating multiconductor flat flexible cable with at least two connectors, each connector having a plurality of contact terminals fixed therein, while simultaneously testing the continuity of each connection, said apparatus comprising:

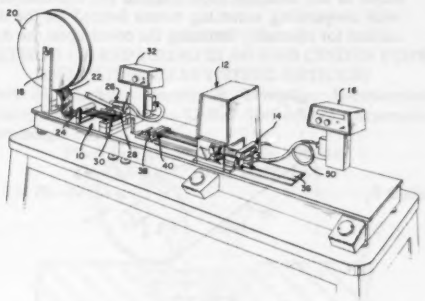
a connector crimp terminating station having cable guide means, connector guide means, and press means to effect crimp engagement of contact terminals of said connector with respective conductors of said cable; and

test indicating means having a test fixture engaged with the first terminated conductor and means to test electrical continuity of each connection as it is effected, said test indicating means comprising:

counter means;

multiplexer means and demultiplexer means connected in parallel to said counter means and said test fixture;

first comparator means connected to receive outputs of said counter means, said multiplexer means and said demultiplexer means;



display means connected to the output of said first comparator means;

second comparator means connected to the output of said counter means and input of said first comparator means; and

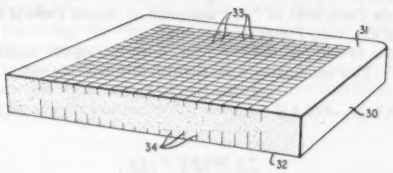
means to set the number of tests to be conducted to equal the number of conductors to be terminated.

4,110,881

RESILIENT ARTICLE AND METHOD OF MANUFACTURE

M. Stafford Thompson, P.O. Box 113, Enfield, Conn. 06082

Filed Dec. 10, 1976, Ser. No. 749,380
Int. Cl.[2] A47C *27/12*
U.S. Cl. 29—91.1 **4 Claims**



3. Process for fabrication of a sofe cushion designed to support a human body in which at least one massive surface of a body having desired dimensions of the final sofa cushion is altered, characterized in that the said body is produced from a larger body by a series of steps comprising slicing, in that the alteration takes the form of slotting the said surface with slots of varying depth or spacing, and covering the said support structure.

4,110,882

COATING ROLLER

Gerard Hodge, Brampton, and Robert J. Holsgrove, Georgetown, both of Canada, assignors to Kenhar Products Incorporated, Brampton, Canada

Filed Oct. 21, 1977, Ser. No. 844,227
Int. Cl.[2] B60B *7/00*
U.S. Cl. 29—118 **2 Claims**

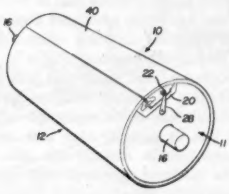
1. A coating roller cover for removable mounting upon an

elongated, cylindrically shaped roller drum to provide the coating applying surface, comprising:

an initially flat, thin, dimensionally stable substrate sheet, such as of thin gauge sheet material, of a size to completely surround the drum surface;

a thick layer of resilient foam plastic material bonded to and covering the substrate for forming the coating applying surface of the roller;

tongue-like connector means formed upon the opposite edges of the substrate sheet adapted for interconnecting with cooperating mounting means formed on the drum surface for releasably fastening the cover upon the drum;



whereby accurately dimensioned covers may be bent around and fastened upon the drum peripheral surface and replaced when worn by similar covers;

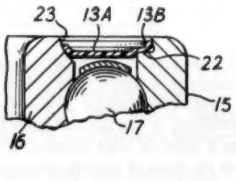
said tongue-like connector means each comprising U-shaped channels bent out of the free edges of the sheet on the uncoated surface of the substrate, and a generally L-shaped rigid strip arranged within the channel and having a leg extending out of the channel and spaced from the uncovered surface of the substrate, wherein said tongue-like connectors are adapted to fit into an inverted, i.e., — undercut, T-shaped groove formed in and extending axially of the surface of the drum, with each connector fitted within a half of the tongue-shaped groove.

4,110,883

METHOD AND APPARATUS FOR INSTALLING A BEARING SHIELD OR SEAL INTO THE ANNULAR SPACE OF A BEARING

William D. McAllister, Poughkeepsie, and Frank D. Rajczi, Hyde Park, both of N.Y., assignors to Schatz Federal Bearings Co., Inc., Poughkeepsie, N.Y.

Division of Ser. No. 664,964, Mar. 8, 1976, Pat. No. 4,054,334.
This application Apr. 1, 1977, Ser. No. 783,555
Int. Cl.[2] F16J *15/16*
U.S. Cl. 29—148.4 S **7 Claims**



1. A method of mounting a plastic bearing seal having a durometer hardness of over 50 into an antifriction bearing comprising an inner annular race ring concentrically located within an outer annular race ring with an annular chamber therebetween containing a complement of rolling elements, one of said race rings having a peripheral seal-retaining groove with an extending shoulder on each side of said ring, the other of said race rings having a land opposite each of said peripheral seal-retaining grooves, said method comprising: providing a flat deformable substantially rigid plastic washer of said durometer hardness in which the width of the annulus thereof is less than the annular opening of said annular chamber but larger than the distance between the land of one of said bearing rings and the shoulder of said peripheral seal-retaining groove of the other,

said washer being produced from a calendered sheet of said plastic and having flow lines therein,

placing said deformable rigid plastic washer into the opening of said annular chamber so that it is supported by said shoulder of said peripheral groove and by said land,

said plastic washer in a selected cross section having said flow lines running along said cross section,

and then causing said washer to flow radially by pressure deformation into and secured within said peripheral groove and provide a seal with the free end thereof extending to the land of said other ring,

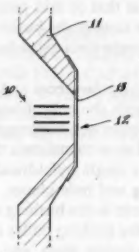
such that the flow lines at the annular neck of said seal are crowded together relative to the flow lines running along said cross section.

4,110,884

METHOD FOR MAKING DUST COVER FOR PRINTING NEEDLES

Sven Gunnar Valter Stenudd, Lidingo, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

Filed Apr. 22, 1977, Ser. No. 789,803
Claims priority, application Sweden, Apr. 23, 1976, 7604708
Int. Cl.[2] B23P *15/16*
U.S. Cl. 29—163.5 R **5 Claims**



1. A method of providing a dust proof cover for printing needles of a mosaic printing head having an opening comprising: placing a thin layer of a selected suitable material over the opening of the printing head for said printing needles, and repeatedly moving each of said printing needles into engagement with said thin layer of material to wear holes therein through which said printing needles can pass.

4,110,885

ENCAPSULATING BLOCK AND REMOVAL APPARATUS

William Frederick Fisher, Peterborough, Canada, assignor to Fisher Gauge Limited, Peterborough, Calif.X

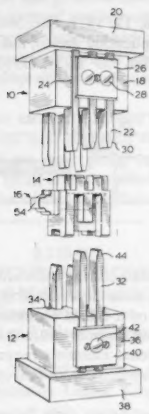
Filed May 26, 1977, Ser. No. 800,724
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—239 **5 Claims**

3. Apparatus for use with an encapsulating block encasing a workpiece, the block having parallel slots in opposed side walls thereof extending alternately from opposed edges of each side wall to terminate in a bearing face in the region of a plane passing through the workpiece and a frangible cross-sectional area of the block, comprising:

a pair of dies;

a plurality of parallel tines projecting in one direction from

each die, the tines being meshable and arranged to be received in the slots of the block to bear against said faces;



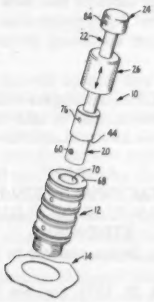
whereby on moving the dies towards one another the block will fracture in said cross-sectional area.

4,110,886

TOOL FOR REMOVING INJECTORS FROM DIESEL ENGINES

Gunter K. Wendler, 1031 Verdemar Dr., Alameda, Calif. 94501; Enrique Corpus, 17410 Langton Way, Hayward, Calif. 94541, and Michael J. Ohannesian, 450 Maple Ave., Cotati, Calif. 94928

Filed Dec. 23, 1976, Ser. No. 753,892
Int. Cl.² B23P *19/04*
U.S. Cl. 29—255 **5 Claims**



1. A tool for removing injectors from diesel engines, comprising:

a head having a cylindrical surface of such diameter as to closely fit within the outer end of the central passage of a diesel injector, said cylindrical surface extending essentially continuously between on end of said head and a shoulder located between said one end of said head and the opposite end of said head, said shoulder extending outwardly from said cylindrical surface;

a pin close-fittingly received in a transverse bore in said head, said transverse bore extending part way into said head from said cylindrical surface and being so located with respect to said shoulder that when said head is inserted into the outer end of the central passage of said diesel injector to the maximum extent permitted by said shoulder said transverse bore can be brought into alignment with a bore in said diesel injector by rotating said head about the axis of said cylindrical surface;

limiting means on said pin and in said bore formed for limiting the outward projection of said pin beyond said cylindrical surface; and

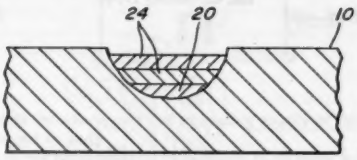
spring means in said bore and compressed between said pin and the internal end of said bore for resiliently urging said pin toward its position of maximum projection from said cylindrical surface.

4,110,887

METHOD OF REPAIRING SLAG AND CINDER POTS AND OTHER HEAVY STEEL ARTICLES

Robert H. Kachik, Washington Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 25, 1977, Ser. No. 790,516
Int. Cl.² B23K *23/00;* **B22D** *19/10*
U.S. Cl. 29—401 A **8 Claims**



1. A method of repairing an erosion cavity in slag and cinder pots, and other heavy steel articles comprising

(a) placing into said cavity an exothermic reaction mixture comprising a fuel powder and a metal oxide, the amount of said mixture having a volume insufficient to overflow said cavity,

(b) igniting said mixture to form a superheated melt comprising a metal phase and a slag phase, such that the melt is substantially contained entirely within said cavity,

(c) maintaining said melt in said cavity for a time sufficient to allow said melt to separate so that said metal phase settles to the bottom with the slag phase thereover,

(d) permitting said melt to solidify with the metal phase securely bonded in the bottom of said cavity,

(e) removing said slag phase to expose the metal phase and the remaining unfilled portion of the cavity, and

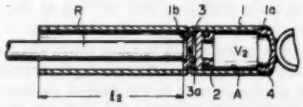
(f) repeating steps (a) through (e) at least one more time to provide a plurality of metal phase layers which fill at least a significant portion of the cavity.

4,110,888

GAS CHAMBER FORMING METHOD IN CLOSED CYLINDER OF GAS ENCLOSED TYPE

Toshiaki Mutou, Kamakura, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Jul. 13, 1977, Ser. No. 815,419
Claims priority, application Japan, Jul. 20, 1976, 51/86395
Int. Cl.² B23Q *17/00*
U.S. Cl. 29—404 **4 Claims**



1. A method for forming a gas chamber in a cylinder of gas enclosed type comprising the steps of inserting a free piston slidably into the cylinder, inserting a stopper having a through hole therein into the cylinder through an open end of the

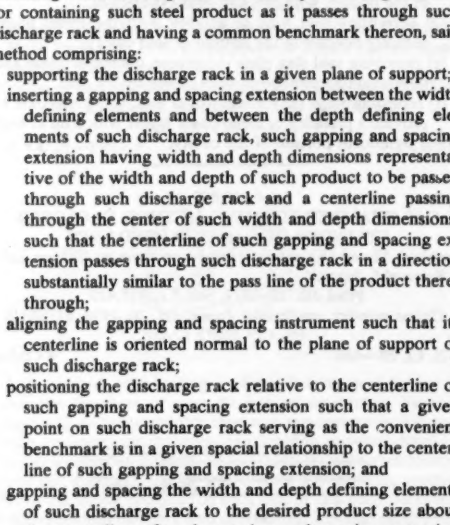
cylinder so as to abut with the free piston, pushing the stopper and the free piston further into the cylinder toward a closed end thereof, securing the stopper with respect to the inner wall of the cylinder when pressure of gas confined between the closed end of the cylinder and the free piston has been increased to a predetermined level, and thereafter, closing the open end of the cylinder.

4,110,889

METHOD OF ASSEMBLING CONTINUOUS CASTING DISCHARGE RACK

Alfred J. Capriotti, Falls Township, Bucks County; Louis G. Lazzaretti, Economy Borough, and Brian O'Donnell, Bristol Township, Bucks County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 645,597, Dec. 31, 1975, Pat. No. 4,074,439.
This application Jul. 25, 1977, Ser. No. 818,788
Int. Cl.[2] B23Q *17/00*
U.S. Cl. 29—407 **7 Claims**



1. A method of gapping and spacing at least one continuous casting discharge rack used in steel product casting, said steel product having a given width and depth, such discharge rack including width defining elements and depth defining elements for containing such steel product as it passes through such discharge rack and having a common benchmark thereon, said method comprising:

supporting the discharge rack in a given plane of support;

inserting a gapping and spacing extension between the width defining elements and between the depth defining elements of such discharge rack, such gapping and spacing extension having width and depth dimensions representative of the width and depth of such product to be passed through such discharge rack and a centerline passing through the center of such width and depth dimensions, such that the centerline of such gapping and spacing extension passes through such discharge rack in a direction substantially similar to the pass line of the product therethrough;

aligning the gapping and spacing instrument such that its centerline is oriented normal to the plane of support of such discharge rack;

positioning the discharge rack relative to the centerline of such gapping and spacing extension such that a given point on such discharge rack serving as the convenient benchmark is in a given spacial relationship to the centerline of such gapping and spacing extension; and

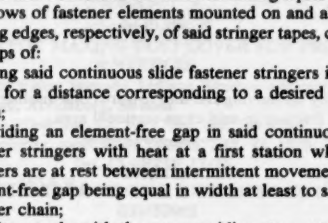
gapping and spacing the width and depth defining elements of such discharge rack to the desired product size about the centerline of such gapping and spacing extension which is transposed to such discharge rack thereby resulting in an alignment of the centerline of several discharge racks when such discharge racks are aligned relative to their benchmarks.

4,110,890

METHOD OF MANUFACTURING SLIDE FASTENERS

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Jul. 11, 1977, Ser. No. 814,150
Claims priority, application Japan, Jul. 12, 1976, 51/82667
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—408 **2 Claims**



1. A method of manufacturing individual slide fasteners from a pair of continuous slide fastener stringers having a pair of stringer tapes made of a fabric including thermoplastic synthetic fibers and a slide fastener chain including a pair of interengaged rows of fastener elements mounted on and along the confronting edges, respectively, of said stringer tapes, comprising the steps of:

(a) feeding said continuous slide fastener stringers intermittently for a distance corresponding to a desired fastener length;

(b) providing an element-free gap in said continuous slide fastener stringers with heat at a first station while said stringers are at rest between intermittent movements, said element-free gap being equal in width at least to said slide fastener chain;

(c) simultaneously with the gap providing step, cutting said continuous slide fastener stringers with heat at said first station along a line extending across said stringers and substantially centrally of said element-free gap, whereby an individual slide fastener length is severed off said continuous slide fastener stringers;

(d) simultaneously with the gap providing step, mounting a bottom end stop on the cut end portion of said individual slide fastener length at said first station;

(e) threading a slider through said slide fastener chain from the cut end portion of said continuous slide fastener stringers while the latter are being advanced from said first station; and

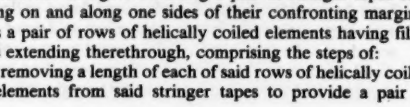
(f) mounting a top end stop on the cut end portion of said continuous slide fastener stringers while at rest at a second station located downstream of said first station.

4,110,891

METHOD OF ATTACHING A SEPARABLE BOTTOM END STOP TO A PAIR OF SLIDE FASTENER STRINGERS

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Jul. 25, 1977, Ser. No. 818,869
Claims priority, application Japan, Jul. 27, 1976, 51/89328
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—408 **2 Claims**



1. A method of attaching a separable bottom end stop having a pin member and a box member including pin part to a pair of slide fastener stringers including a pair of stringer tapes supporting on and along one sides of their confronting marginal edges a pair of rows of helically coiled elements having filler cords extending therethrough, comprising the steps of:

(a) removing a length of each of said rows of helically coiled elements from said stringer tapes to provide a pair of

element-free tape portions with exposed portions of said filler cords left thereon;

(b) bending with heat and pressure said pair of element-free tape portions into pressed contact with said exposed portions of the filler cords, said exposed portions being held in substantial alignment with those portions of said filler cords which are disposed in said rows of helically coiled elements; and

(c) mounting said pin member and said box member on said pair of element-free tape portions, respectively, said pin member and said pin part being substantially equal in thickness to and lying substantially flush with element-supporting portions of said slide fastener stringers.

4,110,892

FABRICATION OF COPPER

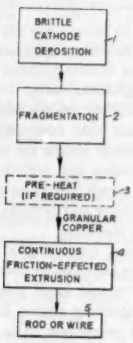
Alan John Bangay, New Malden; Peter Michael Raw, Harrow; Rees Jenkin Llewellyn, Twickenham, and Peter Gregory, Great Missenden, all of England, assignors to BICC Limited, London, England

Filed Jul. 27, 1977, Ser. No. 819,605

Claims priority, application United Kingdom, Jul. 30, 1976, 31763/76

Int. Cl.² B22F *3/24*

U.S. Cl. 29—420 **12 Claims**



1. A method of making an elongate body of copper of electric conductor grade comprising: electrodepositing copper in the form of brittle cathodes; breaking the cathodes into fragments with a mean specific surface area in the approximate range from 25 to 1000 mm^2/g; feeding these fragments as such and without any high temperature treatment for purification or grain growth to a continuously acting friction-effected extrusion machine and by means of that machine working the fragments under pressure sufficiently to consolidate and bond the fragments into a continuous elongate body.

4,110,893

FABRICATION OF Co-Cr-Al-Y FEED STOCK

Richard C. Elam, Manchester, and Nicholas E. Ulion, Marlborough, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 24, 1977, Ser. No. 800,112

Int. Cl.² B22F *3/24*

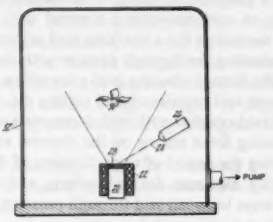
U.S. Cl. 29—420.5 **8 Claims**

1. In the production of an ingot of a selected cross-sectional dimension for use in crucible vaporization for a coating process, the ingot being an alloy having a reactive element as one constituent, the alloy without the reactive element being workable and the reactive element being workable, the complete alloy with the reactive element therein however being much less workable, the completed ingot being fed axially through an opening in the crucible for vaporization to produce a coating vapor having the elements of the alloy in the desired proportions including the reactive element, the crucible having an opening to receive the ingot, the steps of:

forming an elongated billet having the ingredients of and in the proportions of the alloy and without the reactive element included therein;

making a hole from end to end of the ingot, this hole having an area related to the area of the billet substantially the same as the percentage of reactive element in the alloy;

positioning a rod of the reactive element within the billet, said rod having a cross-sectional area related to the area of the billet the same as the proportion of the reactive element in the alloy, said rod extending axially of the billet from end to end;



reducing the billet from its formed size to an ingot having a shape and dimension to fit the opening in the crucible so that it may be fed therethrough and the cross section of the ingot having all the ingredients of the alloy in proper proportion therein, the ratio of the cross-sectional area of the rod in the ingot to the cross-sectional area of the ingot being comparable to the desired percent of the reactive element in the remainder of the alloy; and

feeding the completed ingot through said opening in the crucible for vaporization into an alloy.

4,110,894

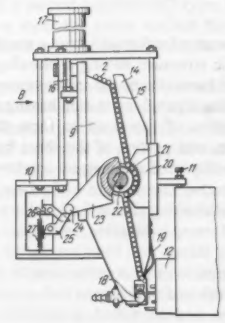
METHOD AND APPARATUS FOR PRODUCING A CONDUIT INTENDED FOR COMMUNICATION WITH A PLURALITY OF WORKING-MEDIUM SOURCES

Alexandr Borisovich Zuev, ulitsa Chervyakova, 6, kv. 121, and David Samuilovich Miller, ulitsa Budennogo, 30, kv. 30, both of Minsk, U.S.S.R.

Filed Mar. 28, 1977, Ser. No. 782,099

Int. Cl.² B22D *19/04*

U.S. Cl. 29—527.6 **8 Claims**



1. A method of producing a conduit intended for communication with a plurality of working medium sources, which conduit includes at least two connecting elements spaced apart along the length thereof and rigidly secured thereto, each of said connecting elements having a through passage intended to communicate with one working-medium source, the axis of

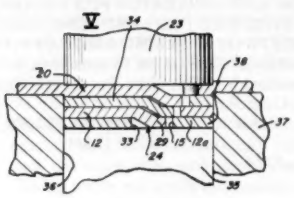
said through passage being perpendicular to a plane passing through the axis of the conduit and said through passage communicating with the passage of the conduit, which method comprises the steps of using a continuous-surface conduit; placing said conduit on a die-casting machine furnished with a device for feeding sequentially a plurality of conduits into a casting die having cavities of a shape which corresponds to the shape of said connecting elements; aligning said continuous-surface conduit in said casting die in such a way that the axis of a core shaping said through passage of each connecting element in said casting die is set off with respect to the axis of said conduit a distance sufficient for obtaining a strong and tight coupling of said connecting element with said conduit and making for access for a working tool adapted to make a duct communicating the through passage with the conduit from the side of the former; shaping said connecting elements, by casting same in said cavities of said casting die; obtaining the coupling of said conduit with said connecting elements by means of a pressing force arising on the external surface of said conduit during the period of crystallization of the material of said connecting elements during cooling; and forming ducts or passageways between said through passages in the connecting elements and said conduit.

4,110,895

APPARATUS FOR MANUFACTURING LAMINATED CORES

Yoshiaki Mitsui, Kitakyushu, Japan, assignor to Mitsui Mfg. Co., Ltd., Kitakyushu, Japan

Filed Jul. 27, 1977, Ser. No. 819,479
Int. Cl.[2] H02K *15/02*
U.S. Cl. 29—564.2 **10 Claims**



1. In an apparatus for forming from a metal sheet a laminated dynamoelectric structure having a plurality of stacked interlocked formed laminations, the improvement comprising:

means defining a punching station having a punch for punching a portion of the sheet to form therein a displaced projection, said portion of the sheet from which the projection is displaced defining an aperture;

means advancing the sheet to a blanking station;

means at the blanking station for blanking out said portion to define a formed lamination, said punching station means, advancing means, and blanking station means being operated seriatim to cause a series of such sheet portions to be formed with said projections and apertures at said punching station and advanced sequentially to said blanking station whereat the formed laminations are blanked out and stacked; and

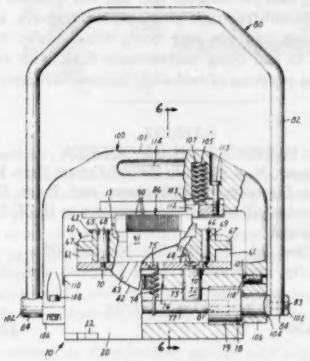
control means for selectively causing the punching station means to continue the punching operation of said punch sufficiently to blank out the projection of the first of the series of said sheet portions to form the first of the laminations of the stack.

4,110,896

CABLE CONNECTING STATION

Russell A. Roiko, Osseo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 735,172, Oct. 26, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 830,853
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—566.3 **7 Claims**



1. Apparatus for attachment of a connector to a multipair cable comprising:

a base having a longitudinal axis,

a connector receiving station on said base having a supply side and a product side comprising a receptacle for a connector, first comb means on said supply side of said station for positioning and indexing pairs of a multipair cable and second comb means on the product side of said station for positioning and holding members of said pairs transverse of said station,

arm means comprising anvil means, said arm means being rotatable about the said axis of said base from a horizontal position to position said anvil means immediately above said connector receiving station in position to contact a connector in said receptacle of said connector receiving station when said connector is covered and said connector receiving station is elevated with respect to said base, and

means in said base for elevating said connector receiving station with respect to said base when said anvil means is positioned over said connector receiving station thereby causing the cable pairs to be inserted into the connector.

4,110,897

APPARATUS FOR AUTOMATICALLY CHANGING TOOL HEADS

Donald D. Hipwell, Mount Clemens, and Klaus Rudolf Menzel, Orchard Lake, both of Mich., assignors to Bendix Machine Tool Corporation, Warren, Mich.

Filed Dec. 2, 1976, Ser. No. 746,774
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **19 Claims**

1. In an apparatus for machining a workpiece at a workpiece station with a changeable tool head sequentially carried by a tool carrier movable between the workpiece station and a loading station, apparatus for sequentially changing the tool head carried by the tool carrier comprising:

a frame;

a track carried by the frame, said track having along its length positions defining a feed station, a load station and a discharge station;

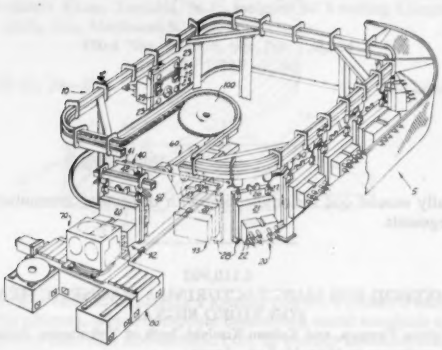
a chain supported by the frame and disposed near the track;

a motor coupled to the chain for driving the chain in a chosen direction;

a plurality of tool heads movably positioned on the track, each tool head carrying means for engaging the chain and

means for sensing proximity to another tool head in the chosen direction and coupled to the chain-engagement means for disengaging the tool head from the chain when proximity to another tool head in the chosen direction is sensed by the sensing means;

means for moving the tool carrier between the workpiece station and the loading station; and



means responsive to the movement of the tool carrier to the loading station for engaging the tool head carried by the tool carrier at the loading station and a second tool head located at the feed station and for moving said heads simultaneously to the discharge station and to the loading station, respectively.

4,110,898

MACHINE TOOL

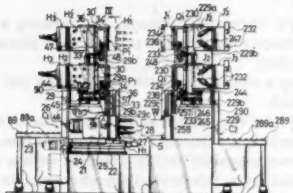
Kojiro Yamaoka, Nishinomiya; Toshihide Mihara, and Akira Tanaka, both of Amagasaki, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Mar. 1, 1977, Ser. No. 773,198

Claims priority, application Japan, Mar. 2, 1976, 51-2025[U]; Mar. 2 1976, 51-25026[U]; Mar. 9, 1976, 51-25749; Dec. 21, 1976, 51-154447; Dec. 28, 1976, 52-177136[U]; Dec. 28, 1976, 52-177137[U]

Int. Cl.² B23Q *3/157*

U.S. Cl. 29—568 **18 Claims**



7. A machine tool comprising:

(a) a bed having a working station;

(b) a slide table which is mounted at a side of the working station on said bed by guide means and which is slidable toward and away from the working station, and motor means for sliding the slide table;

(c) a drive unit having spindle driving motor mounted on said slide table and facing the working station so that the drive unit is moved toward and away from the working station together with said slide table;

(d) an upstanding support frame which is mounted on said bed so that the structure extends above said drive unit;

(e) at least one head storage magazine rotatably mounted on said support frame for rotation around a vertical axis, said magazine having a plurality of head storage rooms provided intermittently along the periphery thereof;

(f) magazine clamping means for selectively clamping said magazine to said support frame structure;

(g) selectively operable head clamping means which are provided to said head storage rooms;

(h) a plurality of spindle heads each having a plurality of spindles and tools connected to said spindles, the heads being stored at said head storage rooms of the magazine by clamping the heads by said head clamping means;

(i) drive means for rotating said magazine when the magazine is not clamped by said magazine clamping means;

(j) vertical conveyor means for lifting and lowering one of said spindle heads selectively between a position in front of said drive unit and a head storage room of said magazine, which room is located just above such position, said vertical conveyor means being arranged to support the underside of the spindle head during lifting and lowering thereof;

(k) second head clamping means for clamping the spindle head located in front of said drive unit selectively to the drive unit; and

(l) connecting means for connecting the spindle head clamped by said second head clamping means to said drive unit so that the spindle is rotated by said drive unit.

4,110,899

METHOD FOR MANUFACTURING COMPLEMENTARY INSULATED GATE FIELD EFFECT TRANSISTORS

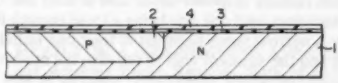
Kouichi Nagasawa, Kunitachi; Yasunobu Kosa, and Satoshi Meguro, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 4, 1977, Ser. No. 756,711

Claims priority, application Japan, Jan. 12, 1976, 51-2057

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **8 Claims**



1. A method for manufacturing complementary insulated gate field effect transistors comprising the steps of:

(a) delimiting a portion of a surface of a semiconductor substrate of a first conductivity type and forming therein a well layer of a second conductivity type, forming a thin insulating layer over the entire surface thereof and then forming a silicon nitride layer over the entire surface thereof;

(b) etching away said silicon nitride layer at least those areas on which field oxide layers are to be formed;

(c) introducing impurity of the second conductivity type at that area in said well layer of the second conductivity type on which the field oxide layer is to be formed;

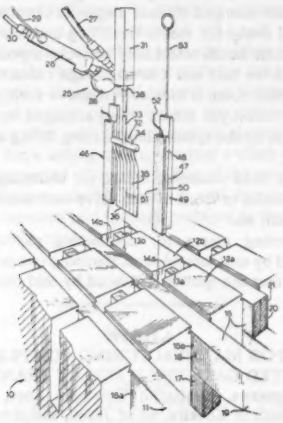
(d) heat treating the substrate to selectively thermally oxidize the areas on which the field oxide layers are to be formed, using said silicon nitride layer as a mask to form a thick field oxide layer; and

(e) removing the silicon nitride layer and the underlying thin insulating layer formed in said step (a), selectively forming gate insulation layers and silicon layers on the exposed substrate and well layer, forming source regions and drain regions of MIS devices in said semiconductor substrate of the first conductivity type and the well layer of the second conductivity type using said silicon layers and said thick field oxide layers as masks, and forming diffusion layers of desired impurity concentrations beneath said thick field oxide layers.

4,110,900
CORONA INHIBITION IN DYNAMOELECTRIC MACHINES

Palmer Lonseth; Hubert Gerald Panter, and Donald G. Moorby, all of Peterborough, Canada, assignors to Canadian General Electric Company, Toronto, Canada

Division of Ser. No. 656,791, Feb. 10, 1976. This application Oct. 17, 1977, Ser. No. 842,757
Claims priority, application Canada, Mar. 7, 1975, 221543
Int. Cl.² H02K *15/08, 15/12;* B29D *3/00*
U.S. Cl. 29—596 **5 Claims**



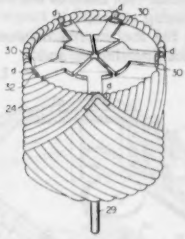
1. In the manufacture of a dynamoelectric machine, having an armature including a core member having a plurality of stacks of magnetic laminations spaced apart axially to define interstack spaces; axially directed slots in said core member; spacers disposed radially in said interstack spaces and dividing them into radially disposed ducts; and at least one coil side in one of said slots, said coil side being a loose enough fit in its slot to leave a narrow space between at least one radial surface of the side and the adjacent wall of the slot; the method of applying a semiconducting, elastomeric material in said space at a core stack comprising (a) blocking said space at both ends of said core stack by inserting blocking means into the adjoining ducts; (b) inserting a flat nozzle into said space by way of the slot opening in a region between said blocking means; (c) forcing a quantity of an uncured, semiconducting, elastomeric material through said nozzle into said space; (d) removing said nozzle from said space; (e) removing said blocking means after the material has initially set to a state where it will remain in place; and (f) curing said material, said cured material being a tough and rubbery compound having an electrical resistance low enough to conduct electric charge from the coil armor to the core stacks and yet high enough to not cause significant eddy current flow between core laminations.

4,110,901
METHOD OF FABRICATING ROTOR COIL FOR CORELESS MOTORS

Yoshimitsu Nakamura, Settsu, and Hajime Kojima, Hirakata, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 29, 1977, Ser. No. 811,295
Claims priority, application Japan, Jun. 30, 1976, 51-78066
Int. Cl.² H02K *15/02*
U.S. Cl. 29—598 **7 Claims**

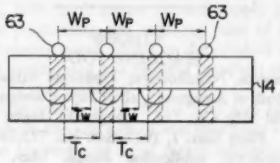
1. A method of fabricating a rotor coil for coreless motors comprising the steps of removing at least a portion of a coated insulation film of an insulation coated wire paid out of a bobbin at predetermined spaced positions, and winding said wire subjected to said removing step into a cylindrical coil by means of a coil winder so that said positions with the insulation film removed will be located at an axial end edge of said cylindrically wound coil for connection with respective commutator segments.



4,110,902
METHOD FOR MANUFACTURING A MAGNETIC HEAD FOR VIDEO SIGNAL

Teizou Tamura, and Katsuo Konishi, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1976, Ser. No. 752,177
Claims priority, application Japan, Dec. 22, 1975, 50-151862; Jul. 14, 1976, 51-82996
Int. Cl.² G11B *5/42*
U.S. Cl. 29—603 **3 Claims**



1. A method of manufacturing magnetic head chips suited for recording and reproducing a video signal, by joining two cores together with an interleaved non-magnetic material layer for defining a gap width, comprising the steps of:

preparing a magnetic body having one plane thereof polished,

forming a trapezoidal channel for defining a window for accommodating a coil in said polished plane of said magnetic core,

preparing a second magnetic body having one plane thereof polished,

abutting said two magnetic bodies to each other with the polished planes thereof facing to each other, and bonding said two magnetic bodies together with a non-magnetic material layer interleaved therebetween to establish the desired gap width, for forming a bonded block,

arranging a plurality of metal wires each having circular cross section parallel with each other at a given pitch,

grinding that surface of said bonded block which corresponds to a plane to be faced to a recording medium by sliding said metal wires longitudinally on said surface while dropping grinding liquid thereon to form a plurality of grooves each having an arcuate cross section extending in a direction which traverses said gap, and

slicing said block along center lines of said grooves to form a plurality of head chips,

said slicing step comprising the sub-steps of arranging metal wires, each having a smaller diameter than that of the wires used to form said grooves, at the same pitch as that of the wires used to form said grooves, arranging additional metal wires, one for each intermediate position of two adjacent wires, and sliding the metal wires thus ar-

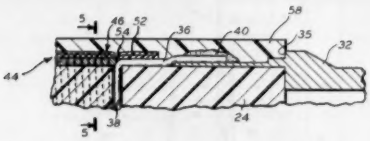
ranged longitudinally thereof on said block while dropping grinding liquid thereon to slice said block along center lines of the respective arcuate grooves and along intermediate lines between two adjacent grooves.

4,110,903

METHOD OF MAKING INDUCTION COILS

Benjamin Kless, Teaneck, N.J., assignor to Vwnding Components, Inc., Hackensack, N.J.

Filed Nov. 5, 1976, Ser. No. 738,334
Int. Cl.[2] H01F *41/06*
U.S. Cl. 29—605 11 Claims



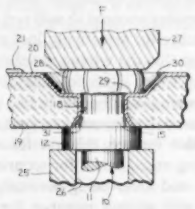
1. The method of making a loading coil for a citizen's band radio antenna, which comprises connecting metal terminals to opposite ends of a non-metallic core of smaller diameter than the metal terminals with confronting faces of the terminals forming flanges at opposite ends of the core that extend between them, winding a wire in a coil around a part of the length of the core with the ends of the coil spaced from both flanges, applying an adhesive tape around the outside of the coil to hold the convolutions of the coil firmly in their positions as wrapped on the core, inserting the core and the tape-wrapped coil in the cavity of a molding apparatus, injecting insulating material into the mold around the tape-wrapped coil and molding a jacket over the tape-wrapped coil throughout the full length of the distance between the flanges.

4,110,904

SUBSTRATE WITH TERMINAL CONNECTIONS AND METHOD OF MAKING THE SAME

Samuel B. Johnson, Wauwatosa, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed May 19, 1977, Ser. No. 798,729
Int. Cl.[2] H05K *1/10*
U.S. Cl. 29—628 3 Claims



1. A method of attaching a lead to an electrical circuit component deposited on an apertured fired ceramic substrate by a swaging operation, wherein the aperture extends through the substrate and said circuit component, said method comprising the steps of:

providing a terminal lead having a first portion and a second portion;

forming said first portion of said lead to provide a plurality of integral, laterally extending, collapsible ridges;

inserting said first portion of said lead through said aperture so that the distal end of said portion extends beyond said substrate,

the collapsible ridges of said first portion being dimensioned to provide a temporary holding force between said lead and the surface of said aperture, whereby the longitudinal axis of said lead and the central axes of said aperture will be maintained in substantial alignment prior to and while said lead is subjected to a final upsetting operation;

said second portion being arranged for electrical connection to a source of electrical energy;

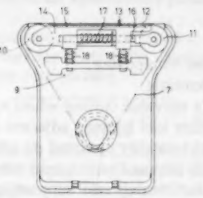
applying a force to said lead along the longitudinal axis thereof to upset the extended distal end portion and to bulge the said first portion to distend this portion radially towards lateral engagement with the surface of said aperture.

4,110,905

SHAVING APPARATUS WITH BAND CUTTER

Hendrik Willem Strijker, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 16, 1977, Ser. No. 807,021
Claims priority, application Netherlands, Jul. 12, 1976, 7607681
Int. Cl.[2] B26B *19/16*
U.S. Cl. 30—43.6 4 Claims



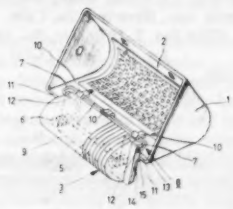
1. A shaving apparatus which comprises a driven endless band cutter, means to drive said endless band cutter continuously, a stationary upper cutter having hair entrance apertures and a stationary lower cutter formed with recesses corresponding respectively to the apertures in the stationary upper cutter, the endless band cutter being disposed between the stationary upper cutter and the stationary lower cutter.

4,110,906

SHAVING HEAD FOR A DRY-SHAVING APPARATUS

Melle Boer, and Albertus Pieter Rentema, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 13, 1977, Ser. No. 805,709
Claims priority, application Netherlands, Jul. 7, 1976, 7607476
Int. Cl.[2] B26B *19/04*
U.S. Cl. 30—43.92 1 Claim



1. A detachable shaving head for a reciprocatory dry-shaving apparatus, which comprises a cap, a flexible shear plate mounted in the cap, a carrying frame hingeably connected to the cap by means of hinge arms, a cutting assembly mounted on the upper side of said carrying frame and provided with a plurality of shaving cutters for co-operation with the shear plate, each hinge arm being hingeably connected to one side of the carrying frame by one of its ends and to the inner wall of the cap at its other end, the underside of the carrying frame having at least one oblique surface whose height decreases inwardly from the edge of the carrying frame, and a stop cam

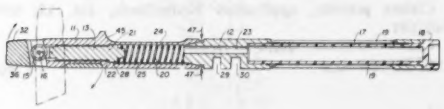
provided on such under side adjacent the inner end of the oblique surface for cooperation with an edge of the cap.

4,110,907

GLASS CUTTER

Ruediger Einhorn, Katonah; Lee Richard Chasen, Port Chester, and Joseph Walter Blake, III, South Salem, all of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.

Filed Mar. 11, 1977, Ser. No. 776,602
Int. Cl.[2] C03B *33/10*; B26B *25/00*
U.S. Cl. 30—164.95 **23 Claims**



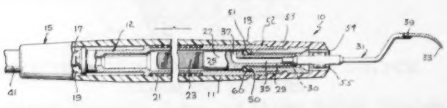
1. A glass cutter, comprising:
an elongated housing;
a longitudinally movable cutting wheel supporting member mounted within said housing adjacent one end thereof;
a cutting wheel rotatably mounted on said member;
a fluid reservoir disposed within said housing;
spring means for biasing said supporting member toward said one end of said housing;
valve means disposed within said housing between said reservoir and said wheel for causing fluid within said reservoir to flow to said wheel in response to longitudinal movement of said member toward the other end of said housing; and
a cutting wheel cover pivotally mounted to said housing adjacent said one end thereof, said cover having (i) an open position in which a surface of said cover is essentially perpendicular to the plane of said wheel, and (ii) a closed position in which a protective portion of said cover is longitudinally aligned with said housing to protect said wheel.

4,110,908

ULTRASONIC DENTAL SCALER

Dale O. Cranston, Lawrence, Kans., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Jun. 3, 1976, Ser. No. 692,291
Int. Cl.[2] A61C *15/00*
U.S. Cl. 32—50 **16 Claims**



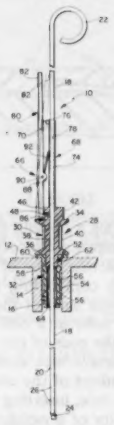
1. A handpiece for ultrasonic scaler comprising:
a shell forming an outer casing for the handpiece;
an electromechanical vibrator comprising an acoustical impedance transformer, an ultrasonic transducer and a dental work tool, said transducer being interconnected at at least one of its ends to said transformer and said work tool, said work tool extending out of one end of said shell; and
means for supporting said vibrator at the plane located at the balance point of said transformer.

4,110,909

DEVICE FOR CLEANING OIL DIPSTICKS

Ernst Mayr, Am Lappenspring 5, 3320 Salzgitter 51, and Heinz Langemeier, Harzstr. 24, 3394 Langelsheim, both of Fed. Rep. of Germany

Filed Jun. 6, 1977, Ser. No. 804,085
Int. Cl.[2] G01F *23/04*
U.S. Cl. 33—126.7 R **7 Claims**

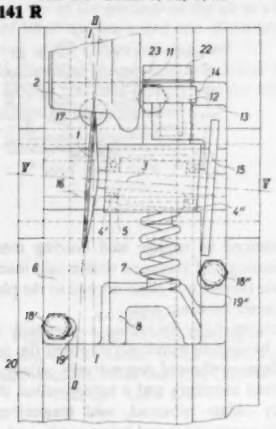


1. An oil dipstick for use in measuring oil level in an oil receiving chamber as formed in a casing, comprising an elongated rod on the outermost end of which a handle is formed, a wiping member removably received in a bore as formed in said casing, said rod slidably extending through said wiping member in frictional contact therewith and being movable outwardly of said casing relative to said wiping member, wherein oil is removed therefrom by contact with said wiping member, and a locking member secured to said rod and engageable with said wiping member for selectively locking said wiping member to said rod, so that the wiping member and rod are removable from said socket as a unit for a reading of the oil level on said rod, said locking member including a pivotally mounted lever on which a hook element is formed, said wiping member having a shoulder formed thereon for receiving said hook element in locking engagement for securing said wiping member to said rod, said lever being pivotally movable to release said rod from said wiping member for movement relative thereto, the portion of said wiping member that extends into said bore being sufficiently flexible to provide for a friction fit therein, a single recess portion formed in the uppermost end of said wiping member, said shoulder being located in said recess portion, the portion of the locking member on which the hook element is formed being dimensioned for extending into said recess portion, wherein said hook element is receivable on said shoulder for locking said wiping member to said rod, said locking member further including a bracket that is molded in fixed relation around said rod and including a longitudinally extending slot that projects entirely through said bracket, wherein said rod extends through said bracket for projection thereabove, said lever being received in said slots in parallel relation to said rod and being pivotally connected to said bracket, the handle as formed on said rod being located substantially above said lever.

4,110,910
APPARATUS FOR SIMULTANEOUSLY MEASURING THE OUTER DIAMETER OF SETS OF PROFILED WHEELS

Theodor Dombrowski, Erkelenz, Germany, assignor to Wilhelm Hegenscheidt GmbH, Erkelenz, Germany
Germany

Continuation of Ser. No. 525,374, Nov. 20, 1973, abandoned.
This application Dec. 2, 1976, Ser. No. 746,867
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1974, 2358383
Int. Cl.[2] G01B 3/12, 5/10
U.S. Cl. 33—141 R 2 Claims



1. An apparatus for simultaneously measuring the outer diameter of a set of profiled wheels having conical tread surfaces, which are produced by a turning operation and therefore are formed at the tread surfaces with circumferentially extending grooves, said apparatus comprising a pair of generally cylindrical metering wheels having nominally identical diameter and width, the effective measuring width of each of said cylindrical metering wheels being substantially equal to the square root of the product 1.6 times the permissible tread diameter difference between the wheels of said set times the radius of a rounded cutting edge of a tool used for turning said surfaces, and the permissible diameter difference of said metering wheels being substantially equal to the product of the nominal diameter of said metering wheels times 20% of the permissible diameter difference of the tread diameters divided by the nominal tread diameter; and means mounting said metering wheels for turning movement about respective axes of rotation extending parallel to the generatrix of the respective conical tread surface.

4,110,911
SHINGLE GAGE

Robert J. Sucheck, 319 Colonial Dr., Monroe, Mich. 48161

Filed May 2, 1977, Ser. No. 792,938
Int. Cl.[2] G01B 5/16
U.S. Cl. 33—188 2 Claims

1. A shingle gage for aligning a second row of shingles to a first row of shingles, said shingle gage comprising:

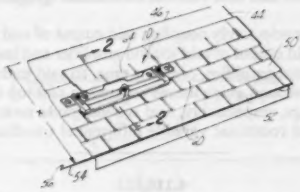
a first elongated member having a first alignment surface adapted to abut against one edge of the first row of shingles;

a pair of arms, said arms being secured to opposite longitudinal ends of the first member and generally perpendicular thereto, each arm having a longitudinal slot formed therethrough;

a second elongated member, said second member having a second alignment surface adapted to abut against one edge of the second row of shingles, said second member having a threaded stud extending upwardly from each end;

said arms of said first member being positioned over the second member so that the studs extend through the slots in the arms;

nut means for threadably engaging said studs and locking



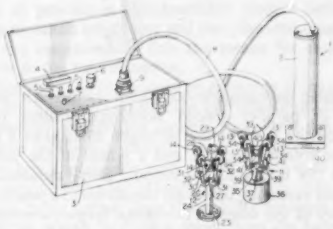
said members together so that said members are substantially parallel but spaced from each other and so that said alignment ourfaces are substantially parallel to each other; and

a layer of soft resilient material secured to the underside of said first member for frictionally engaging and retaining said gage to the roof surface.

4,110,912
TRIAXIAL DEFLECTION METER

John David Lytle, St. Louis, and James M. Combs, Wentzville, both of Mo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 29, 1977, Ser. No. 828,796
Int. Cl.[2] G01C 9/00; G01B 5/30
U.S. Cl. 33—312 10 Claims



1. A deflection meter for measuring deflection, tilt and rotation of a grooved casing, comprising:

a hollow body being open at its top end and at its bottom end;

a top end cap detachably secured to said hollow body for closing said top end of said hollow body;

a bottom end cap detachably secured to said hollow body for closing said bottom end of said hollow body;

a first servo-accelerometer secured inside said hollow body, said first servo-accelerometer having an output;

a second servo-accelerometer secured inside said hollow body, said second servo-accelerometer having an output;

a first amplifier secured inside said hollow body, said first amplifier having an input and an output;

a second amplifier secured inside said hollow body, said second amplifier having an input and an output;

a third amplifier secured inside said hollow body, said third amplifier having an input and an output;

means for coupling said output of said first servo-accelerometer to said input of said first amplifier;

means for coupling said output of said second servo-accelerometer to said input of said second amplifier;

a rotational variable differential transformer secured inside said hollow body, said variable differential transformer having an output;

means for coupling said output of said variable differential transformer to said input of said third amplifier;

a source of electrical power located remote from said hollow body;

means for coupling said source of electrical power to said first servo-accelerometer, said second servo-accelerometer, said first amplifier, said second amplifier, said third amplifier and said variable differential transformer;

a meter;

means for selectively coupling said output of said first amplifier, said output of said second amplifier and said output of said third amplifier, one at a time, to said meter, and

first and second guide means secured to said top and bottom end caps, respectively, said second guide means connecting said rotational variable differential transformer.

4,110,913

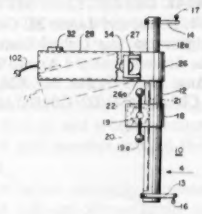
AUTOMOBILE FRONT END ALIGNMENT EQUIPMENT

Roy E. Dick, 3758 Blue Rock Rd., Cincinnati, Ohio 45239

Continuation-in-part of Ser. No. 205,260, Dec. 6, 1971, which is a division of Ser. No. 757,190, Aug. 5, 1968, Pat. No. 3,643,337, which is a continuation-in-part of Ser. No. 368,460, May 19, 1964, Pat. No. 3,457,653. This application Jun. 27, 1974, Ser. No. 483,705

Int. Cl.[2] G01B *13/195, 19/295, 5/255*

U.S. Cl. 33—336 **10 Claims**



1. A camber indicating device which comprises a carriage, a plurality of parallel spaced horizontal rollers rotatably mounted on the carriage and arranged to support a tire of a vehicle for rotating the tire and a wheel of the vehicle on which the tire is mounted, a support frame mounted on the carriage and extending upwardly therefrom to a position opposite a center of the wheel, a horizontal frame mounted on the support frame and alignable with a center of the wheel, a head member pivotally mounted on the horizontal frame, a wheel sensing frame rotatably mounted on the head, means on the wheel sensing frame for alignment transversely of the axis of the wheel, means for indicating the angle between the horizontal frame and the head member, and means for rotating one of the rollers to turn the tire and wheel, the indicating means indicating camber of the wheel.

4,110,914

HAND COMPASSES

Nils Ruder, Fareham Hants, England, assignor to Normark Corporation, Minneapolis, Minn.

Continuation of Ser. No. 643,009, Dec. 22, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 774,864

Int. Cl.[2] G01C *17/06, 17/08*

U.S. Cl. 33—355 D **4 Claims**

1. An improvement in the structure of hand held compases, including:

a. a first outer housing providing an upper and a lower surface and sides between said surfaces to provide an enclosed cavity;

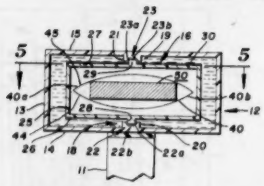
b. bearing members provided in aligned relation respectively on each of said upper and lower surfaces of said outer housing and being inwardly directed;

c. a second, inner housing having an upper and a lower surface and sides between said surfaces to provide an enclosed cavity;

d. aligned pivot members extending outwardly from said upper and lower surfaces of said inner housing and engaging said bearing members of said outer housing to permit rotation of said inner housing in a first plane within said outer housing;

e. said side surfaces of said inner housing including a pair of diametrically opposed aligned bearing members directed inwardly into said cavity;

f. a magnet body having diametrically opposed pivot members arranged to engage said bearing members of said inner housing and arranged within said inner housing and moveable therein in a plane normal to the plane of rotation of said inner housing; and,



g. said magnet body including a generally circular body portion having diametrically opposed flat portions on the circumference thereof respectively adjacent the magnet body pivot members and a cross section defining a substantially oblate spheroid, said magnet member being generally rectangular and being positioned generally centrally of said body and arranged generally normal to the diametrically opposed pivot members.

4,110,915

MANUFACTURE OF CEMENT

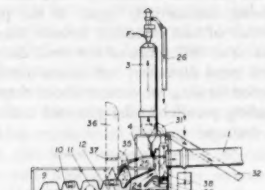
Gerard Ghestem, Lambersart, France, assignor to Fives-Cail Babcock, Paris, France

Filed Dec. 13, 1976, Ser. No. 750,230

Claims priority, application France, Dec. 12, 1975, 75 38049; Sep. 28, 1976, 76 29040

Int. Cl.[2] F26B *7/00;* **F27B** *7/02*

U.S. Cl. 34—20 **16 Claims**



1. A process of manufacturing cement, wherein raw material is converted to clinker in a rotary tubular kiln and the clinker is discharged from the kiln through a hood onto a grate in a cooler, the cooler including a housing connected to the hood, means for supplying fresh air into the cooler housing at one end thereof, and means for conducting different portions of the air from the cooler housing, comprising the steps of

(a) moving a layer of the clinker discharged from the kiln on the grate in the cooler housing from a hot zone to an increasingly cooler zone,

(b) supplying the fresh air the cooler zone at the one end

remote from another end of the cooler housing wherein the clinker is discharged,

(1) the layer of the clinker being moved on the grate from the other end of the one end of the cooler housing,

(c) passing the fresh air countercurrently through the layer of the clinker several times from the one end to the other end whereby a heat exchange takes place between the air and the clinker and the temperature of the air progressively increases,

(d) subsequently introducing the air from the cooler zone into two sections of the hot zone,

(e) conducting one of the portions of the air at a temperature in excess of 1000° C from a first one of the sections of the hot zone out of the cooler housing, and

(f) conducting another air portion at a lower temperature from the second hot zone section into the kiln for use as secondary heating air in the kiln.

4,110,916

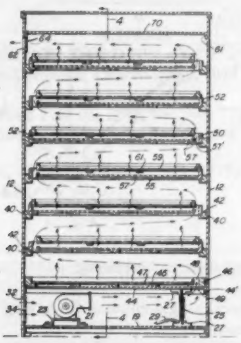
FORCED AIR FOOD DRIER

Harold E. Bemrose, 423 E. Alder, Walla Walla, Wash. 99362

Filed Aug. 30, 1976, Ser. No. 718,910

Int. Cl.[2] A23B *4/04*

U.S. Cl. 34—197 **9 Claims**



1. A forced air drier for food such as fruits and the like, said drier comprising a cabinet having a top, a bottom and side wall means extending between said top and bottom and defining an access opening in one side of said cabinet, a door removably closing said access opening, support means within said cabinet for removably supporting vertically spaced food supporting tray structures, a plurality of tray structures removably supported in relative vertically spaced relation from said support means within said cabinet, each of said tray structures including a pair of vertically spaced upper and lower food support and radiant heat sheets, respectively, said food support sheets being foraminous, alternating opposite sides of said vertically spaced tray structures including means defining upstanding air flow passages therethrough communicating the spaces between adjacent pairs of tray structures and into which the adjacent portions of the spaces between pairs of upper and lower sheets open, said spaces between adjacent tray structures, said spaces between upper and lower sheets, and said passages defining a tortuous air passage through said cabinet around said tray structures, and means operative to force heated air through said tortuous passage in said cabinet.

4,110,917

ELECTRONIC EXPERIMENTING KIT

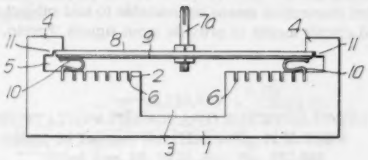
Guy Oscar Le Grelle, Borgerhout, Belgium, assignor to Xaverius College, Borgerhout, Belgium

Filed Feb. 24, 1977, Ser. No. 771,590

Claims priority, application France, Feb. 26, 1976, 76 05354

Int. Cl.[2] G09B *23/18*

U.S. Cl. 35—19 A **5 Claims**



1. In an electronic experimenting kit, of the kind comprising a base;

a number of conductors mounted on said base, said conductors being electrically insulated relative to one another, extending substantially in parallel relationship with one another and being accessible from the one major face of the base;

a number of electronic components having connecting terminals;

a number of plates, each component being so mounted on a plate that the terminals thereof are electrically insulated from one another;

at least two conductors so mounted on each plate that they are electrically insulated from one another, each electronic component terminal on a plate being electrically connected to one of the conductors mounted on the plate;

means to removably fasten each plate on the base, and

means to provide a disconnectible contact between one base-mounted conductor and one plate-mounted conductor the improvement that the means for fastening the plates to the base comprise;

two rims mounted on the base on each side of the conductor set also mounted on said base and extending substantially in parallel relationship thereto, each such rim having a groove on the side thereof facing the opposite rim, each plate being receivable with both opposite ends thereof in the groove provided in both said opposite rims, the plate length being longer than the spacing between those rim portions which lie farther away from the base than the grooves, but equal at the most to sum of said spacing and the depth of a groove or of the deepest groove when the grooves have different depths, the plate-mounted conductors being so arranged that they cross the base-mounted conductors when said plates are engaged with the end thereof inside the grooves provided in the base rims;

spring-action conductor elements which are completely independent from the base and the plates, said elements being designed for wedging between the base and each plate to press said plates against the rims by moving the plates away from the base and for contacting a plate-mounted conductor and a base-mounted conductor, said elements thus forming said electrical contact between any one of the conductors mounted on a plate and any conductor of at least one conductor set mounted on the base.

4,110,918

MODULAR BIOFEEDBACK TRAINING SYSTEM

J. Michael James, Cambridge; James F. Fee, Needham, and Richard M. Horton, Duxbury, all of Mass., assignors to Cyborg Corporation, Brighton, Mass.

Filed Jul. 21, 1976, Ser. No. 707,295

Int. Cl.[2] G09B *19/00*

U.S. Cl. 35—22 R **15 Claims**

1. Apparatus for use in the biofeedback training of a subject

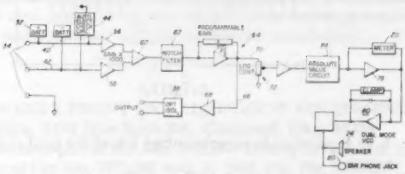
either as an independent apparatus or in operative conjunction with other complementary and separately housed apparatus, comprising:

(a) a relatively small, portable housing,

(b) first stage biofeedback circuit means in said housing for processing signals fed thereto to a first level of conditioning,

(c) power means connected to said circuit means for energization thereof,

(d) first connection means connectable to said subject and to said circuit means to provide input signals thereto,



(e) second connection means connectable to said circuit means and to said other apparatus whereby input signals processed by said circuit means to said first level of conditioning are transferred to said other apparatus as an input thereto for processing to a second level of conditioning,

(f) sensory signal generating means in said portable housing connected to and responsive to said first stage circuit means and adapted to produce sensory signals as a feedback to said subject,

(g) said circuit means including first stage electronic filtering means adapted to pass signals only within a predetermined bandpass, and

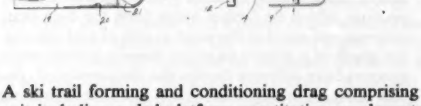
(h) control means in said housing for varying said bandpass.

4,110,919

SKI TRAIL FORMING AND CONDITIONING DRAG

Lucien Henrichon, 373 St. Paul St., St. Gabriel, Canada

Filed Apr. 5, 1977, Ser. No. 784,889
Claims priority, application Canada, Apr. 5, 1976, 249587
Int. Cl.[2] E01H 4/00
U.S. Cl. 37—10 **2 Claims**



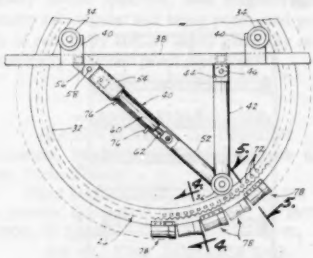
1. A ski trail forming and conditioning drag comprising a sled unit including a sled platform constituting an elongated plate having a smooth, continuous, flat underface and a front portion forming an upwardly curved leading end, and a pair of runners of common ski width secured against said underface longitudinally extending in the longitudinal direction of said plate, in operatively normal ski-apart lateral spacing relationship relative to each other, and said pair of runners each having a bottom face spaced a predetermined height from said underface of said plate, whereby the depth of ski trace imprints made by the runners does not exceed the predetermined height defined by the vertical distance between the bottom face of the runners and said underface of said plate, each runner having a pointed front end forming a tip and the bottom face of the corresponding runner extends flat and co-planar with the corresponding tip, said drag further comprising a front unit, a pivotal connection joining the sled unit to the front unit, said pivotal connection including a draw bar rigidly secured to the sled platform of the sled unit and projecting from the curved leading end of the sled platform and longitudinally of the latter, a sleeve bearing secured axially upright to the front end of the draw bar, an upright rod rigidly secured to the said front unit, said sleeve bearing being slidably and pivotally engaged over said rod for pivoting and upright sliding displacements of the sled unit relative to the front unit, and said front unit including a frame, a single runner unit, a height adjustment mechanism adjustably connecting said single runner unit to said frame for height adjustment of said frame relative to the single runner, and wherein said height adjustment mechanism includes a post extending upright through said frame and slidable endwise relative to the latter, said single runner unit is fixedly secured to the lower end of said post, a lever is pivoted to said post above said frame and is pivoted to the latter about a pair of transverse parallel axes respectively, and a locking device releasably connects said post to said frame for up-and-down adjustment and locking of said post and height adjustment of said frame relative to the single runner unit, whereby said single runner unit remains at the same angle relative to said frame in any height adjustment position.

4,110,920

SLACK TAKEUP APPARATUS FOR AN ENDLESS EXCAVATING MEMBER

Stanley L. Brown, Lenox, Iowa, assignor to Roscoe Brown Corporation, Lenox, Iowa

Filed Feb. 28, 1977, Ser. No. 772,558
Int. Cl.[2] E02F 5/08
U.S. Cl. 37—97 **5 Claims**



1. An excavating device comprising;

a support frame,

at least one generally rigid circular rim having a plurality of excavating members mounted thereon,

mounting means retentively movably mounting said circular rim to said frame for movement of said excavating members in a continuous circular path,

said mounting means comprising a maximum of three wheels including first and second wheels mounted to said frame for rotation about stationary axes and a third wheel movable relative to said first and second wheels, all three of said wheels being circumferentially spaced on said circular rim so as to engage said circular rim for rotatable retentive engagement therewith,

said first, second, and third wheels being comprised of substantially hard rigid material,

an elongated longitudinally extensible power member pivotally mounted at one of its ends to said frame and pivotally mounted at the other of its ends to said third wheel,

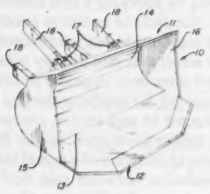
a second elongated member pivotally connected at one end to said frame and pivotally connected at the other end to said third wheel,

said third wheel movable radially outwardly of said circular rim in response to extension of said elongated power member, thereby to take up slack between said wheels and said circular rim.

4,110,921
BUCKET CUTTING EDGE

John M. Poker, Jr., Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 19, 1977, Ser. No. 834,742
Int. Cl.[2] E02F 3/00
U.S. Cl. 37—141 R 14 Claims



1. In a bucket assembly having a bucket portion defining a front edge adapted to have a cutting edge welded thereto, the improvement comprising:

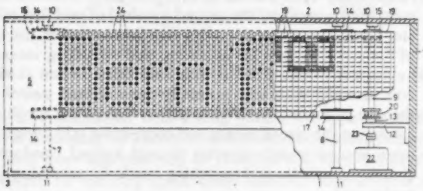
a cutting edge assembly having a front, hardened portion, a rear portion having a hardness less than that of the front portion, said front portion being welded to said rear portion and subsequently straightened to define a prefabricated assembly effectively free of welding distortion; and

weld means securing said rear portion of the prefabricated straightened cutting edge assembly to said front edge of the bucket free of distortion of the bucket assembly as the result of the elimination of need for preheating of the cutting edge assembly in welding said prefabricated assembly to said cutting edge.

4,110,922
APPARATUS FOR THE DISPLAY OF INFORMATION

Ruth Leemann-Dittmann, Casa Martina, 7017 Flims-Dorf, Switzerland

Filed Feb. 25, 1977, Ser. No. 772,256
Claims priority, application Switzerland, Feb. 27, 1976, 2469/76
Int. Cl.[2] G09F 11/15, 11/26
U.S. Cl. 40—447 8 Claims



1. Apparatus for the display of information comprising:

(a) at least one endless draw member guided around at least two reversing pulleys;

(b) a motor driving said endless draw member;

(c) a plurality of outwardly protruding holders carried by said draw member and extending transversely of the longitudinal direction thereof;

(d) a plurality of laminae carried by each of said holders with a free end thereof extending beyond the holder;

(e) the length of each lamina being greater than the distance between adjacent holders in the extended zone of the draw member whereby an overlap zone of adjacent laminae is maintained in said extended zone;

(f) the radius of one reversing pulley, the length of the laminae, and the distance between the draw member and the connection of the laminae to each holder being so related that said overlap is eliminated when said laminae pass round the said one reversing pulley;

(g) means for determining the position of the free ends of the laminae situated near the end of the reversal of the draw member by said one reversing pulley;

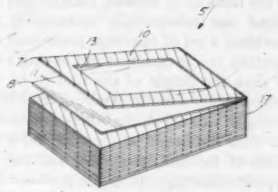
(h) said means selectively directing said lamina to a position either in front of or behind the overlap region of an adjacent lamina;

(i) each lamina having a forward region and a rearward region differentiated visually from one another whereby a desired display can be set up by selective exposure of said regions.

4,110,923
PRESENTATION-FRAME AND BACKING UNITS PAD

Frank Shore, 26 Lantern Rd., Hicksville, N.Y. 11801

Filed Apr. 19, 1973, Ser. No. 352,588
Int. Cl.[2] G09F 1/12
U.S. Cl. 40—152 3 Claims



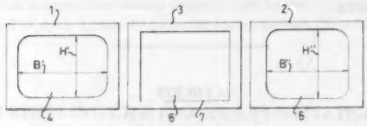
1. A picture frame and backing tablet device comprising in combination: stacked tablet detachable sheet structures including (a) a first plurality of first sheet-like substantially opaque elements each having first upper and lower planar surfaces with a first circumscribing periphery, and (b) a second plurality of second sheet-like substantially opaque elements each having second upper and lower substantially planar faces with a second circumscribing outer periphery, at least one of said second sheet-like elements being disposed between consecutive ones of said first sheet-like elements; a tablet edge-connecting strip means detachably interconnecting substantially aligned portions of stacked said sheet structures at one side edge of said first and second circumscribing peripheries such that there is formed a tablet pad having stacked detachable units edge-connected to one-another of the units serially arranged from a top to a bottom of the tablet pad, each detachable tablet unit including the inter-connected first and second peripheries; each first sheet element of said plurality having at least one through-passage being defined by passage-circumscribing walls of the first periphery of the first sheet-like element, the first through-passage being of sufficient cross-sectional area that the passage-circumscribing walls form a first-element picture frame for each unit, said second sheet-like element's upper face being of sufficient area for said second sheet-like element to serve as a backing element for a picture to be mounted on said upper face for viewing through said through-passage for each detachable unit; each said first upper face including an inner circumscribing edge of its through-passage, a severence slot through a partial thickness of the thickness of the first sheet-like element defining an edge-margin strip, each of the first sheet-like element's through-passage defined by a plurality of linear inner edges of said edge-margin strip with adjacent consecutive linear edges defining an acute angle, and extending from an apex of the acute angle there being a total severence through substantially the entire thickness of the first sheet-like element transversely across the respective edge-margin strip such that each edge-margin strip may be pivotably turned downwardly and optionally under the first sheet-like lower face and such that the edge-margin strip is easily totally separable by tearing if desired.

4,110,924

MOUNT FOR X-RAY FILMS

Bo Moderatho, Lidingo, Sweden, assignor to Bo Moderatho & Company AB, Lidingo, Sweden

Filed Dec. 7, 1976, Ser. No. 748,328
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—158 B **2 Claims**



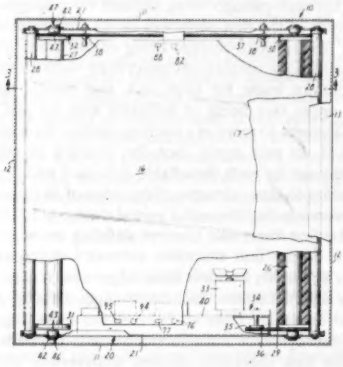
1. Mount for viewing X-ray films and the like including: two opaque rigid sheets and, secured between said opaque sheets, a spacer sheet having substantially the same thickness as the thickness of the films to be viewed, each of said opaque sheets having at least one substantially rectangular opening, and together providing a set of openings positioned opposite each other, the opening in one opaque sheet having a height dimension smaller than the height of the film to be viewed and a width dimension larger than the width of the film to be viewed and the opening of said set in the other opaque sheet having a height larger than the height of the film and a width smaller than the width of the film, providing said one opaque sheet with two opposite film supporting rim portions for one face of a film along two opposite side edge portions of said film and said other opaque sheet with two opposite film supporting rims for the other face of the film along the other two opposite edge portions of the film; said spacer sheet having weakening lines which enable parting and removal of a screening spacer sheet part having substantially the same length and width dimensions as that of the film whereby a removed screening part may be reinsertable in the mount so that the set of openings in said opaque sheets formed by the removal of a screening part may be covered.

4,110,925

AUTOMATIC SCROLL SIGN

Neal T. Strand, New Richmond, Wis., and Richard J. Esboldt, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1977, Ser. No. 782,027
Int. Cl.[2] G09F *11/00*
U.S. Cl. 40—466 **3 Claims**



1. In a sign structure having a display area, a scroll adapted for moving past the display area to display information thereon at the display area, and a rotatable motor actuated by line and common conductors for moving said scroll, the improvement comprising:

said scroll having at least one section containing information display regions in seriatim along the length of the scroll and being wound on and extending between two rolls;

said rotatable motor being reversible and having first and second input terminals, the direction of rotation thereof being controlled by applying a first conductor selected from the line conductor and the common conductor to one of the first or second input terminals, said motor being adapted for advancing the scroll past said display area in a first direction and in a second direction, opposite to said first direction;

a motor control circuit for applying the line conductor and the common conductor to said motor, comprising,

(1) switching means connected to the first conductor and actuated upon application of a signal thereto for switching the first conductor between said first and second input terminals to change the direction of motor rotation,

(2) circuit means for selectively applying the second of the line conductor and the common conductor to the motor, comprising,

(a) a normally-open first switch, adapted for closing upon a scroll display region being at the sign structure display area for connecting said circuit means to the second conductor,

(b) a first relay having a coil and first and second terminals, said first terminal connecting said second conductor to the motor for advancing the scroll when the coil is inactuated, said coil being actuable for disconnecting the first terminal from said second conductor and connecting the second terminal to the said second conductor,

(c) a second relay connecting the second conductor to said first relay coil upon closure of said normally open first switch for actuating said first relay to connect the second terminal thereof to said second conductor, and having a coil for actuating said second relay to disconnect said second relay from said second conductor, and

(d) time delay means actuated by the closing of the said normally-open first switch for applying a delayed signal to actuate the coil of said second relay to disconnect said second relay from said second conductor, thereby deactuating said first relay coil to connect said first terminal thereof to said second conductor,

(3) a normally-open second switch connected between said switching means and the second terminal of said first relay and closing concurrently with said first switch at the end of the scroll section for actuating said switching means,

(4) a normally-open third switch, said third switch closing concurrently with said normally-open second switch at the end of the image areas at either end of the scroll for bypassing the circuit means and connecting said normally-open second switch directly to said second conductor, thereby to actuate said switching means for reversing said motor and

(5) a manually operable, normally closed fourth switch connected to said second conductor between said first switch and said third switch for overriding said first switch and said circuit means.

4,110,926

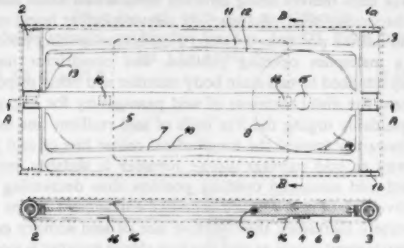
CHANGEABLE EXHIBITOR COMPRISING A VIDEO OR SCRIPT TAPE MOVABLE IN A CLOSED LOOP

Borge Andreas Ravn, Copenhagen, Denmark, assignor to Moviefig APS, Copenhagen, Denmark

Filed Nov. 3, 1976, Ser. No. 738,396
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—485 **2 Claims**

1. In a changeable exhibitor comprising a video or script tape movable on vertical guide rollers in a closed loop and being controlled by a means of a weighted roller in the interior space of said loop, wherein said weighted roller is freely movable on a substantially horizontal roller path, a member is

provided on at least one side of said weighted roller, and projections are provided on the side of the tape facing the roller path, said member having direct unilateral cooperation with



said projections for advancing the tape in response to movement of the weighted roller in one direction along the roller path.

4,110,927

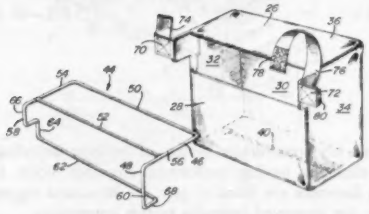
SPENT LONG GUN SHELL CADDY

Jack LeRoy Morris, 1513 W. 151 St. Ter., Olathe, Kans. 66061

Filed Feb. 24, 1977, Ser. No. 771,794

Int. Cl.[2] F41C *27/00*

U.S. Cl. 42—1 T **7 Claims**



1. In combination with a long gun of the type including a barrel extending forwardly from a receiver in which rounds to be fired from said gun may be received and further including structure for ejecting spent shells laterally outwardly of one side of said receiver, a spent shell catcher removably supported from said gun and defining a receptacle spaced laterally outwardly from and opening toward said one side of said receiver for receiving and catching spent shells ejected from said receiver, said receptacle including a hollow container including upstanding and interconnected near and far sides adjacent and remote, respectively, from said receiver, the upper portion of said near side defining an entrance opening into the interior of said container, said container further including a top side interconnecting the upper marginal portions of said near and far sides, said receptacle further including a support frame including an elongated horizontal upper portion and a horizontally elongated upstanding portion extending along and depending downwardly from one longitudinal edge of said upper portion, said upper portion of said frame underlying and supporting the marginal portions of said top side, said upstanding portion including opposite end upright portions for abutting the adjacent side surfaces of said gun.

4,110,928

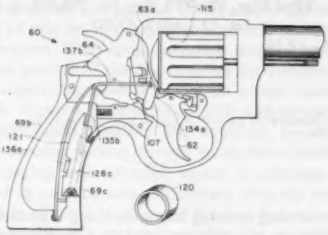
SAFETY DEVICE FOR PREVENTING UNAUTHORIZED ACTUATION OF A TOUCH-ACTUATED MECHANISM

Joseph E. Smith, 170 Locksumart Way #23, Sunnyvale, Calif. 94087

Continuation-in-part of Ser. No. 670,937, Mar. 26, 1976, Pat. No. 4,067,132, which is a continuation-in-part of Ser. No. 530,891, Dec. 9, 1974, Pat. No. 3,978,604. This application Mar. 24, 1977, Ser. No. 781,035

Int. Cl.[2] F41C *17/00*

U.S. Cl. 42—66 **4 Claims**



1. In a safety device for preventing the unauthorized firing of a weapon having a trigger, a cylinder for holding cartridges to be fired by said weapon, a cylinder rotation means operative in response to movement of said trigger, a hammer, and hammer actuation means, wherein the invention comprises:

a magnetic actuable member pivotally mounted with respect to said cylinder rotating means;

stop means for preventing said member from pivoting beyond a predetermined arc; and

bias means for maintaining said member in a position of the arc for preventing movement of said cylinder rotation means to thereby prevent firing of said weapon.

4,110,929

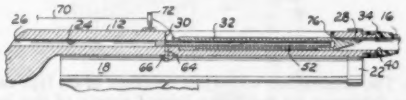
FISHING ROD AND PROJECTILE FIRING GUN

Dwayne R. Weigand, 8504 S. Miller, Oklahoma City, Okla. 73159

Filed Dec. 7, 1977, Ser. No. 858,147

Int. Cl.[2] A01K *91/02*; F41F *1/04*

U.S. Cl. 43—19 **6 Claims**



1. In a gas operated pistol having a hand grip secured to a magazine capable of containing a charge of gas under pressure for propelling a projectile and having a trigger means for releasing the gas charge, the improvement comprising:

a barrel having a longitudinal through bore and having a forward end and a breech end longitudinally mounted on said magazine,

said barrel having a lateral port communicating with the gas charge and having a longitudinal opening in its forward end portion communicating with its bore;

an elongated projectile freely received by the barrel opening and longitudinally slidable within the barrel bore,

said projectile having a pointed forward end and having an elongated axial socket open at its other end;

an elongated flexible strand secured to said other end of said projectile;

a tubular bolt having a closed rearward end slidably received longitudinally by the bore and the projectile socket,

said bolt having a lateral port adjacent its closed end communicating with the lateral port of said barrel,

said lateral port communicating by a passage through said bolt with said elongated axial socket of said projectile; and,

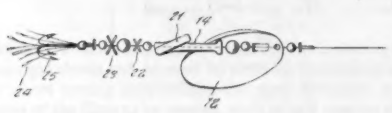
latch means normally preventing rearward movement of said bolt.

4,110,930

NON-TWISTING SPINNING LURE

Ronald Daniels, 115 Clover Ridge Ave., Fort Thomas, Ky. 41075

Filed Mar. 17, 1977, Ser. No. 778,669
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.14 **3 Claims**



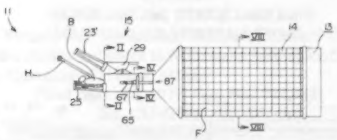
1. A non-twisting spinning lure comprising in combination, a single main blade rotatably mounted on a shaft attached to a connecting wire fixedly secured in a lead body, said single main blade being at a fixed acute angle to said shaft and connected thereto by a bracket arm and an opening in an end of said blade, said single main blade having a raised lip on a leading edge thereof, said lead body having a keel portion and a center of gravity on one side of the longitudinal axis of said connecting wire, said keel portion of said lead body having a twist therein whereby rotational forces created by said single main blade and said lead body are in opposite directions.

4,110,931

INSECT BAIT DISPENSING DEVICE

John F. Maness, Memphis, Tenn., assignor to Cricket Corporation, Ripley, Tenn.

Filed Nov. 5, 1976, Ser. No. 739,353
Int. Cl.[2] A01K *97/04*
U.S. Cl. 43—55 **10 Claims**



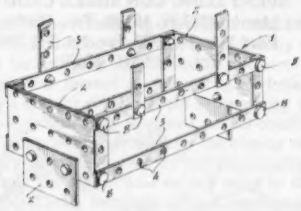
1. The combination with a bait container of the type carried by a fisherman for holding a limited supply of live insects which he uses as fish bait, of a bait dispensing head attached to said bait container for facilitating the act of empaling the insect with a fishhook and for subsequently facilitating a gentle unrestrained removal of the empaled insect therefrom, said bait dispensing head comprising a main body member and solitary cage-like entrapment means defining a distal end of said dispensing head for capturing a single insect and constraining the captured insect in an optimum position for facilitating thrusting the fishhook therethrough, said solitary cage-like entrapment means including a pair of jaw members with at least one of said jaw members being pivotally attached to said main body member for pivotal movement thereof between closed and open positions, said main body member including a passageway communicating the interior of said bait container with said pair of jaw members, lever means attached to said movable jaw member for facilitating manually moving said pair of jaw members to the open position for unrestraining the hooked insect thus enabling it to be gently removed from said solitary cage-like entrapment means, and gate means for varying the size of said solitary cage-like entrapment means to selectably constrain insects of various different sizes therein, said gate means including a carriage sleeve member slidably received within said passageway for slidable movement to and fro therein, a plurality of resilient tine members having their root portions fixedly attached to said carriage sleeve member with the free ends thereof being directed toward said distal end of said dispensing head, said carriage sleeve member being movable to infinite positions between a minimum opening position and a maximum opening position, and constrictor means fixedly attached to said main body member and being disposed adjacent the distal terminus of said passageway for engaging and yieldably urging the free ends of said resilient tine members inwardly toward the longitudinal center line of said passageway as said carriage sleeve member is slidably moved toward said minimum opening position thus decreasing the effective size of said solitary cage-like entrapment means and conversely increasing the effective size of said solitary cage-like entrapment means as said carriage sleeve member is moved toward said maximum opening position.

4,110,932

TOY CONSTRUCTION SYSTEM HAVING REUSABLE DISTENSIBLE JOINING MEMBERS

Robert L. Brass, Westport, Conn., assignor to General Mills Fun Group, Inc., Minneapolis, Minn.

Continuation of Ser. No. 660,320, Feb. 23, 1976, abandoned.
This application Jan. 3, 1977, Ser. No. 756,275
Int. Cl.[2] A63H *33/10*
U.S. Cl. 46—29 **15 Claims**



1. In a toy construction system of the type including structural elements having preformed alignable holes through which fasteners are fitted to join the structural elements together, the improved fastening system comprising:

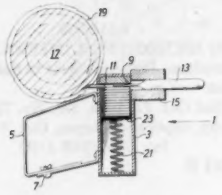
reusable rivet elements formed of distendable material, each rivet element having an elongated body with a relaxed diameter greater than the diameter of the holes in the structural elements and a diameter, when distended longitudinally, less than the diameter of said holes, an enlarged base at one end for applying a longitudinal distending force to the rivet element, a shoulder next to the base for spacing the base from the structural elements, and an internal bore extending through the base, shoulder and body to the opposite end of the rivet element, said opposite end being closed for receiving a longitudinal distending force applied to the rivet element through said bore; and

a device for inserting and withdrawing the rivet elements from the holes in the structural elements, said device comprising closable jaw means for engaging the base of said rivet element, an elongate wire positionable in a bore of said rivet element against its opposite closed end, and means for relatively moving the jaw means and wire apart to distend the rivet element to reduce the diameter of its body for insertion into or withdrawal from said holes, and for moving the jaw means and wire together to relax the rivet element when in said holes to increase its diameter for fastening the structural elements together.

4,110,933
PROCESS AND AN APPARATUS FOR KILLING TREES OR WOODY PLANTS

Per Häggblom, Uppsala, Sweden, assignor to Edsbyns Industri AB, Edsbyns, Sweden

Filed Jan. 17, 1977, Ser. No. 759,835
Claims priority, application Sweden, Jan. 27, 1976, 7600849
Int. Cl.² A01G 7/06
U.S. Cl. 47—57.5 5 Claims

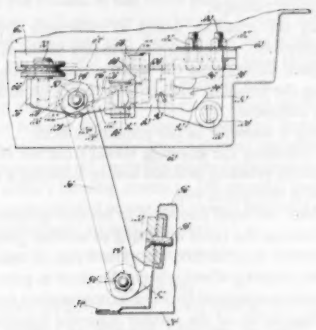


1. An apparatus for applying a biocide to trees and woody plants having bark comprising:
- discrete injection means for carrying a quantity of biocide for insertion into a tree;
- means for feeding a plurality of said injection means in sequence; and
- means for driving said injection means sequentially into the tree substantially into the area between the bark and the wood of the tree.

4,110,934
HINGE MECHANISM FOR A SLIDING DOOR

John F. Zens, Algonac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1977, Ser. No. 855,169
Int. Cl.² E05D 15/10
U.S. Cl. 49—218 2 Claims

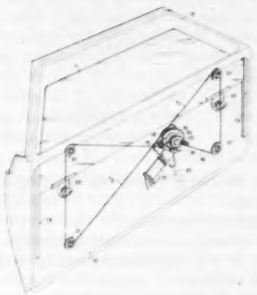


1. An improved hinge and latch mechanism for supporting one edge of a vehicle sliding door to initially move the one edge laterally from a vehicle body during an opening operation and subsequently to guide movement of the one edge in a longitudinal direction along the vehicle body comprising: a link member having spaced end portions, one end portion of which is attached to the one edge of the door in a manner permitting pivotal movement about a generally vertical axis therebetween, the other end portion of the link member being operably attached to the vehicle, a track supported by the vehicle and extending in a general horizontal direction longitudinally with respect to the vehicle, a carriage member movable along said track with means operably engaging the other end portion of said link member to permit a pivotal movement therebetween about a substantially vertical axis, whereby the spaced end portions of said link member are aligned in substantial longitudinal orientation with respect to the vehicle when the door is closed, but are movable with respect to one another by pivoting of the link member into a laterally outward transverse orientation with respect to the vehicle after the door begins its opening movement, a latch mechanism associated with said link member for locking said link member in its transverse orientation subsequent to initial door opening movement, thereby permitting the link member and carriage to thereafter follow the track to the door's fully open position, said latch mechanism including a striker supported at one end of said track adjacent the one end of said door when in a closed position, a latch lever pivotally attached at its midpoint to the carriage about an axis parallel to the axis of the end portion, one end of said lever engageable with said striker when the door is closed, latch lever actuating means attached to the other end portion of the link member for rotation therewith and for controlling pivotal movement of said latch lever between an engaged latch position with said striker and a released unengaged position, said actuating means having a shoulder-forming portion thereon, an opposite end of said latch lever engaging said actuating means to maintain said latch lever and its one end into engagement with the striker when the door is closed and to move the one end into a released position as the link member rotates, the shoulder-forming portion engaging the opposite end surface after a predetermined rotation of the link member to its transverse orientation, thereafter locking the link member **16** in its transverse orientation during sliding movement of the door with respect to the vehicle body as produced by movement of the carriage along the track, and guide means adjacent said striker positioned to engage the one end of said latch lever, thereby pivoting the latch lever so as to free the opposite end from the shoulder-forming portion as the door moves toward its closed position and thereafter permitting the link member to pivot from its transverse position to its longitudinally oriented position.

4,110,935
CABLE-ACTUATED, CAR-SIDE-WINDOW-LIFTING MECHANISM

Terenzio Sessa, Via Albani 5, Varese, Italy

Filed Nov. 7, 1977, Ser. No. 848,880
Claims priority, application Italy, Nov. 10, 1976, 29190 A/76
Int. Cl.² E05F 11/48
U.S. Cl. 49—352 4 Claims



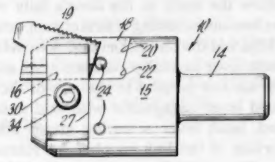
1. A cable-actuated car-side-window lifting mechanism in which the lifting or depressional motion of the window glass plate is carried out by the rotation of a pulley around which there are wound and unwound two portions of the cable fastened to the bottom edge of the plate glass, characterized in that, in combination with said pulley two idle rollers are provided which are confrontingly mounted and about which said two cable sections are partially wound, said two rollers being mounted by the agency of supporting members for being rotated about the axis of the pulley in unison freely and discretly against the bias of counteracting means.

4,110,936

GRINDING ARBOR

Bela Augusztin, 261 Fourth Ave., Stratford, Conn. 06497

Filed Apr. 7, 1977, Ser. No. 785,325
Int. Cl.[2] B23G *3/04*
U.S. Cl. 51—218 R **6 Claims**



1. A grinding arbor for holding one or more chasers, comprising:

(a) a substantially cylindrical body,

(b) at least one longitudinally extending section defining a planar seat and a laterally disposed side wall substantially parallel with the longitudinal axis of said body thereby defining a mount for engaging a chaser along its bottom surface opposite the cutting face and along its side lateral to the bottom surface,

(c) adjustable means laterally disposed relative to said planar seat for engaging the marginal edge of the chaser lateral to the bottom surface engaged by said planar seat, and

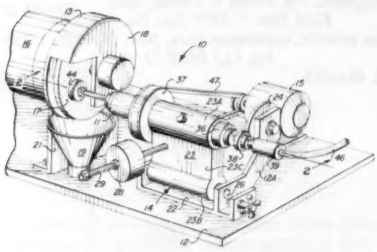
(d) means for releasably securing a chaser in said mount.

4,110,937

HOLDING MEANS FOR GEM STONES

Kenneth E. Bein, 2518 Last Ave., Kingman, Ariz. 86410

Filed Jul. 25, 1977, Ser. No. 818,548
Int. Cl.[2] B24B *13/00, 7/00*
U.S. Cl. 51—229 **2 Claims**



1. A vacuum chucking means for securing a work piece therein comprising:

a hollow cylindrical member,

said member defining a cup shaped depression at open end,

the periphery of said depression forming a circular plane ring shaped surface,

a relatively thin double surfaced adhesive vinyl tape means formed from a water and oil insoluble material having one of its surfaces secured to said ring shaped surface,

the other of said surfaces of said adhesive vinyl tape means being provided for engaging and holding a work piece, and

means for partially evacuating the space within said cup shaped depression through said hollow cylindrical member,

whereby the combined effect of said adhesive means and said evacuating means firmly holds the work piece when moved against a work forming tool,

a first means for rotating said cylindrical member,

a second means for selectively moving the axis of said cylinder to a number of different parallel positions while in contact with a work forming tool and in conjunction with the operation of said evacuating means, and

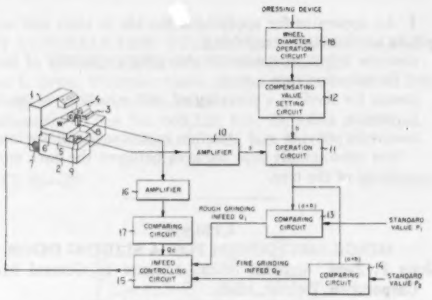
cam means for bearing against said cylindrical member for selectively varying the different parallel positions of said cylindrical member against the work forming tool.

4,110,938

INFEEDING METHOD FOR INTERNAL GRINDERS

Shohei Ito, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Japan

Filed Oct. 21, 1976, Ser. No. 734,430
Claims priority, application Japan, Oct. 31, 1975, 50-131797
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—281 R **2 Claims**



1. A method of operating an internal grinder having a grinding wheel, comprising:

rapidly infeeding the grinding wheel from a rest position to a grinding position;

operating the grinding wheel to effectuate grinding and simultaneously infeeding the grinding wheel at an infeeding speed slower than the speed of rapid infeeding;

returning the grinding wheel to the rest position after grinding is complete;

measuring a diameter of the grinding wheel;

rapidly infeeding the grinding wheel from the rest position to another grinding position before initiating a subsequent grinding operation; and

controlling the rapid infeeding to another grinding position to terminate the rapid infeeding to another grinding position earlier than the first-mentioned step of rapidly infeeding the grinding wheel when a decrease in grinding wheel diameter is measured in order to compensate for increased grinding ability of the smaller diameter grinding wheel.

4,110,939

CUPROUS OXIDE CONTAINING RESIN BONDED ABRASIVE ARTICLE AND PROCESS FOR MANUFACTURING SAME

John J. Bodolai, Niagara Falls, Canada, assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Jun. 13, 1977, Ser. No. 805,768
Int. Cl.[2] C09K *3/14*
U.S. Cl. 51—298 R **26 Claims**

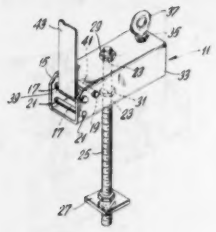
25. An abrasive article comprising an abrasive bonded with from about 5 to about 20 weight percent of a cured phenolic resin containing from about 0.2 to about 5 weight percent cuprous oxide.

4,110,940

ANCHORING SYSTEM

Donald Vanderlyn, Burger Rd., West Shokan, N.Y. 12481

Filed Oct. 17, 1977, Ser. No. 842,555
Int. Cl.[2] E04H *12/20;* E02D *5/80;* E06B *3/54*
U.S. Cl. 52—23 10 Claims



1. An anchoring system for securing a structure to the ground, comprising:

an elongated flexible belt, said belt being adapted to pass over said structure;

first and second anchor housing means for location on opposite sides of said structure, both said first and said second anchor housing means being elongated hollow members with an outer pair of horizontally-aligned openings and an inner pair of horizontally-aligned openings, said outer pair of horizontally-aligned openings and said inner pair of horizontally-aligned openings being adjacent one another and adjacent one end of said anchor housing means, said outer pair of horizontally-aligned openings being located nearer said one end of said anchor housing means than said inner pair of horizontally-aligned openings, each of said first and second anchor housing means having at least one pair of vertically-aligned openings located substantially midway between its two ends;

an outer pin located in said outer pair of horizontally-aligned openings and an inner pin located in said inner pair of aligned openings, said flexible belt engaging both said outer pin and said inner pin with at least three layers of said flexible belt engaging said outer pin;

fastening means, said fastening means being secured to each anchor housing means at the opposite end from said outer and inner pairs of horizontally-aligned openings;

means engaging said vertically aligned openings for securing each anchor housing means to the ground; and

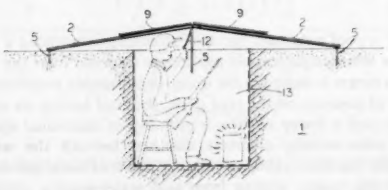
tie bar means located at one end to said fastening means and at the other end to said structure.

4,110,941

INSTANT OPEN GOOSE AND DUCK PIT COVER

Robert K. Scott, P.O. Box 488, Caldwell, Id. 83605

Filed Mar. 14, 1977, Ser. No. 776,973
Int. Cl.[2] E04B *7/16*
U.S. Cl. 52—66 5 Claims



1. A hunting blind which is adapted to be placed over a pit or other enclosure to camouflage the presence of one or more hunters, said hunting blind comprising:

a. a mounting means adapted to be supported on the earth surface and made of light weight tubing,

b. a pair of cover panels made of light weight tubing and laced with smooth strand wire adapted to receive camouflage material as required, said panels being slidably disposed on said mounting means,

c. a tension spring means comprising at least two spring elements, each spring element secured between one of said cover panels and said mounting means and biasing the cover panels to slide away from each other on the mounting means, and

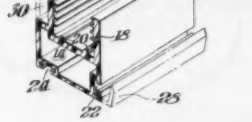
d. a release mechanism holding said panels together in the closed position, whereby upon activation of the release mechanism the pair of cover panels will slide away from each other automatically under the influence of said tension spring means.

4,110,942

WINDOW FRAME MANUFACTURE

Leon F. Slocomb, Jr., 2641 W. Robino Dr., Sherwood Park, Wilmington, Del. 19808

Filed May 6, 1977, Ser. No. 794,357
Int. Cl.[2] E04C *2/10*
U.S. Cl. 52—100 6 Claims



1. An article of manufacture for use as a section of a window frame or the like comprising a tubular body, said tubular body including a window pane receiving wall, a single pair of generally parallel legs extending away from said window pane receiving wall for receiving a window pane therebetween with the window pane supported by said window pane receiving wall, a locking rail appendage secured to said window pane receiving wall and extending away therefrom in generally the same direction as said parallel legs, a locking lip appendage secured to the wall of said tubular body remote from said window pane receiving wall at a location diametrically opposite said locking rail appendage, said locking lip appendage extending in generally the same direction as said parallel legs, said locking lip appendage being spaced from said tubular body a sufficient distance to comprise interlocking means with said locking rail appendage whereby a frame section having a locking rail appendage and another frame section having a locking lip appendage are interlocked when one of the frame sections is inverted with respect to the other frame section and the locking rail appendage thereon fits against the locking lip appendage, and said appendages thereby adapting said body to function as a different preselected frame section upon the selected removal of at least one of said appendages.

4,110,943

ANIMAL GUARD

Gaynor Carlson, 28 N. Second St., Atwood, Kans. 67730

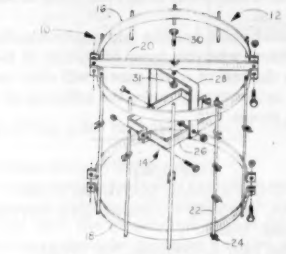
Filed Jan. 14, 1977, Ser. No. 759,459
Int. Cl.[2] A01M *29/00*
U.S. Cl. 52—101 15 Claims

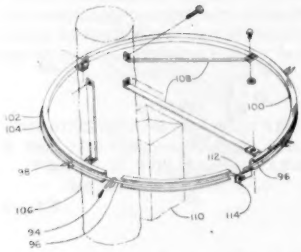
8. An animal guard assembly for protecting an object such as a post-like member or an electrical pedestal unmounted or

mounted on a post-like member against rubbing by an animal, comprising:

(a) a band having an outwardly facing peripheral groove;
(b) a ring mounted in said peripheral groove;
(c) circumferentially spaced barbs mounted on said ring having their pointed ends protruding outwardly, and
(d) attachment arms fixed at their bases to said band for attachment to said post-like member.

13. An animal guard assembly for protecting an object such as a post-like member or an electrical pedestal unmounted or mounted on a post-like member against rubbing by animals, comprising:



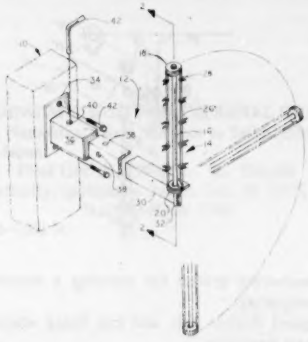


(a) at least one support element for supporting animal repelling elements;
(b) outwardly protruding animal repelling elements supported around the periphery of said support element; and
(c) attachment means for attaching said support element to said electrical pedestal or to said post-like member;
(d) said attachment means comprising an attachment bracket for attachment over said electrical pedestal or post-like member, a U-shaped bracket mounted on said attachment bracket, and means for rotatably and removably attaching said support element to said U-shaped bracket.

4,110,944
ANIMAL PROTECTIVE GUARD
Gaynor Carlson, 28 N. Second St., Atwood, Kans. 67730
Filed Jan. 14, 1977, Ser. No. 759,463
Int. Cl.[2] A01M *29/00*
U.S. Cl. 52—101 **9 Claims**

1. An animal guard assembly for protecting an electrical pedestal mounted on or adjacent a post-like member such as a stub shaft comprising:

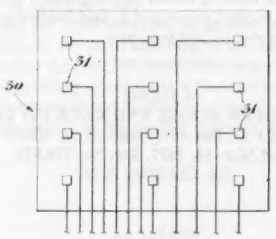
(a) a base plate for attachment to said post-like member;
(b) a sleeve member secured to said base plate for holding a supoort arm in various angular positions;
(c) a support arm adjustably and removably secured by one end within said sleeve member for holding a guard assembly, said guard assembly comprising:
(1) a central support rod attached by one end to said support arm;
(2) a barb supporting element;
(3) a cap or stop member secured to the free end of said central support rod;
(4) a support plate secured to said central support rod at a point spaced from said cap;
(d) said barb supporting element being mounted on said



central support rod between said cap and said support plate, and comprising:

(1) a top plate having a central hole therein and a bottom plate having a central hole therein connected by at least one barb supporting rod-like member having barbs supported thereon.

4,110,945
ROOF INSTALLATION FOR LOCATING WATER LEAKAGE POINTS
James P. Sheahan, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Sep. 7, 1976, Ser. No. 720,935
Int. Cl.[2] E04D *1/00, 13/00*
U.S. Cl. 52—173 R **4 Claims**



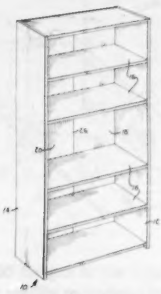
1. In a roof structure, the roof structure comprising a roof deck, a water-impermeable membrane disposed over the roof deck, a means to maintain the water-impermeable membrane in a desired position on the roof deck, the roof having an upper surface and a lower surface, a plurality of individual spaced apart water-sensing elements disposed beneath the water-impermeable membrane and adjacent the roof deck, individual connecting means leading from said water-sensing elements whereby an instrument in connection with said sensing elements can be employed to determine if the individual sensing elements are in contact with water.

4,110,946

SPLIT BACK FURNITURE ARTICLE AND METHOD OF ASSEMBLY

William P. Louther, Jr., Madison, Wis., assignor to AFP Corporation, Madison, Wis.

Filed Aug. 15, 1977, Ser. No. 824,291
Int. Cl.[2] A47B *47/00*; E04C *3/10*
U.S. Cl. 52—223 R **9 Claims**



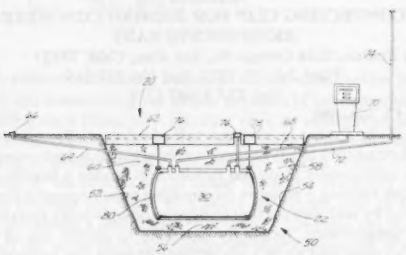
1. A furniture article comprising:
first and second frame members spaced apart from one another;
a first flat panel having opposite edges;
means for connecting one edge of said first panel to said first frame member with the other panel edge located between said first and second frame members;
a second flat panel having opposite edges; and
means for connecting one edge of said second panel to said second frame member with the other edge of said second panel butting against said other edge of the first panel,
the combined undeformed dimension of said first and second panels between the edges thereof being greater than the distance between said frame members, whereby when said other edges of said panels butt against one another the panels are held under compression in extension between said frame members.

4,110,947

STORAGE TANK INSTALLATION

James T. Murray, and Walter T. Gorman, both of Brooklyn, N.Y., assignors to Murgor Electric Company, Inc., Brooklyn, N.Y.

Filed Dec. 9, 1977, Ser. No. 859,013
Int. Cl.[2] B65D *25/00*
U.S. Cl. 52—249 **15 Claims**



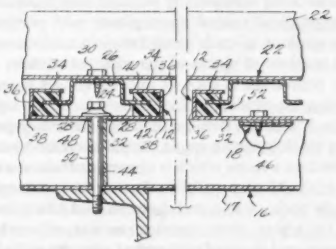
1. A method of installing an underground storage tank comprising:
excavating to a predetermined depth sufficient for the placement of a storage tank of desired size therein below ground level with at least one pair of opposing side walls of the excavation being shaped to minimize the danger of collapse;
backfilling the excavation with a base layer of footing material;
placing a double shell storage tank into the excavation resting on the base layer;
installing double shell piping conduits and leak monitoring means between the shell and ground level;
backfilling the excavation with covering material over the tank, piping and monitoring means to a height adjacent ground level;
pouring a solid slab over the tank and backfill layers without closing access to the underground piping conduits and the monitoring means; and
enabling the excavating, backfilling, placing of the tank, installing of piping and monitoring means and pouring of the slab to be accomplished without the necessity of personnel entering the excavation.

4,110,948

THERMAL INSULATING CLIPS FOR METAL INSULATED WALLS AND ROOFS

Adolph J. Maier, Jr., 128 W. Livingston Pl., Metairie, La. 70005

Filed Mar. 11, 1977, Ser. No. 776,884
Int. Cl.[2] E04B *1/62*
U.S. Cl. 52—402 **9 Claims**

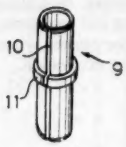


1. In a wall assembly: a plurality of elongated, parallel, metal support members mutually spaced apart in a direction transverse to their lengths; a plurality of elongated, parallel metal sub-girts mutually spaced apart in a direction transverse to their lengths, said sub-girts being spaced from said support members; thermally insulating clip assemblies spanning the space between at least some of said support members and at least some of said sub-girts and supporting said sub-girts from said support members; each of said clip assemblies including a clip portion extending transversely of the respective sub-girt and having opposite end portions folded toward the respective sub-girt and clamping each longitudinal edge portion of the respective sub-girt between clamping surfaces on said end portions and clamping surfaces on a central section of the clip portion, with a layer of non-metallic thermally insulating material disposed between each side of each sub-girt edge portion and each adjacent clamping surface, each of said clip assemblies further including means extending transversely of the central section of the respective clip assembly to space said respective central section from the respective support member, said means being connected to said central section and to the respective support member.

4,110,949
BUILDING BLOCK

Giulio Cambiuzzi, Imola (Bologna), and Michele Montanelli, Stabbia (Florence), both of Italy, assignors to Baupres AG, Eschen, Liechtenstein

Filed Jun. 28, 1977, Ser. No. 810,829
Claims priority, application Switzerland, Jul. 5, 1976, 8565/76; Feb. 24, 1977, 2295/77
Int. Cl.² E04B *2/48*
U.S. Cl. 52—437 5 Claims



1. A wall structure including:

a plurality of substantially similary blocks arranged in horizontal courses; the end faces of the blocks of each course being in contact with one another and being positioned above an intermediate point of the blocks of the subjacent course; each block having:

an upper face and a lower face having identical shape, said two faces being substantially paralled, said faces comprising longitudinal spaced apart planar side portions, the planar portions of each block being in contact with the planar portions of blocks of the adjacent courses,

a central depression in each of said upper and lower faces extending longitudinally for the whole of the length of said block between two longitudinal planar side portions,

each said block having a single central aperture having in a cross-section a shape which is symmetrical about a median plane of the block parallel to the end faces thereof,

a recess in each of said end faces of said block having a shape, in a plan view, identical to that of one half the cross-sectional shape of said central aperture as divided by said median plane of symmetry, to define a chamber identical to said aperture when mated with a recess in an adjacent block,

each central depression of each said block having, in cross-section, two longitudinal channel parts separated by an elevated central region having a plane upper face which is recessed with respect to the surface of said two planar portions of the associated one of said upper and lower faces of said block,

holes in each said block opening into said central elevated region of said central depression of each of said upper and lower faces, and being symmetrically disposed with respect to said aperture in said block,

locating pins housed in at least some of the holes and extending into the holes of adjacent blocks of adjacent courses,

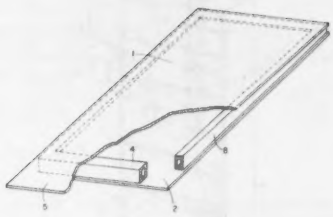
said depressions in each block defining between adjacent courses of blocks, horizontal channels which link said apertures and chambers, and

a body of cast concrete filling said chambers, recesses and horizontal channels to provide an interconnected horizontal and vertical network of reinforcing concrete to hold said blocks together in said wall.

4,110,950
INSULATING DOUBLE GLASS PANE

Franz Mainz, Dusseldorf, Germany, assignor to Gerresheimer Glas Aktiengesellschaft, Dusseldorf-Gerresheim, Germany

Filed Jul. 21, 1976, Ser. No. 707,213
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1975, 2532634
Int. Cl.² E04D *1/04*
U.S. Cl. 52—518 1 Claim



1. A double glass pane for double glazing such as for the roof of a hothouse comprising a first flat four-sided pane, a second flat four-sided pane spaced from said first flat pane in face to face relation therewith, a closed rectangular arrangement of spacer pieces located between said first flat pane and said second flat pane adjacent the edges thereof with said first flat pane, said second flat pane and said spacer pieces defining a closed space between said panes, each of said first and second panes having a first pair and a second pair of oppositely disposed edges, the edges of each of said first pairs being aligned one opposite the other, one of the edges of each of said second pairs being aligned one opposite the other with the other one of the edges of each of said second pairs being displaced laterally out of opposite alignment with the other one of the second pair of edges of said first pane projecting laterally from the other one of the second pair of edges of said second pane, said first and second panes being in diverging relation from the oppositely aligned edges of said second pair of edges toward the other ones of said pair of edges with the spacing between said first and second panes increasing from the oppositely aligned second edges to the other second edge of said second pane by an amount substantially equal to the thickness of said first pane, said double glass panes being arranged so that in use for covering the inclined roof of a hothouse the projecting portion of the said first pane overlaps the edge of an adjacent said double glass pane formed by the oppositely aligned edges of the second pair of edges with the overlapping portion covering the joint between the adjacent said double glass panes for preventing the collection and seepage of rainwater at such joints.

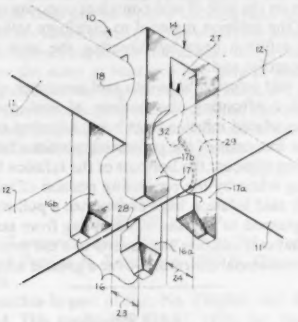
4,110,951
CONNECTING CLIP FOR JOINING CONCRETE REINFORCING BARS

John Padrun, 3154 Orange St., San Jose, Calif. 95127

Filed Jul. 21, 1977, Ser. No. 817,516
Int. Cl.² E04C *5/16*
U.S. Cl. 52—686 3 Claims

1. A clip for use in joining a pair of substantially cylindrical reinforcing bars of a type used in reinforcing concrete comprising a substantially U-shaped molded unit having a flexible web portion forming a pressure transmitting panel, opposed flanges carried by said web portion to depend downwardly therefrom, said flanges being yieldingly separable to permit one of said bars to enter and lie in a plane therebetween, the confronting surfaces of said flanges including arcuately relieved portions for yieldingly receiving and gripping said one bar therein independently of the other bar, aligned openings formed through said flanges for receiving the other bar therein disposed crosswise of said one bar, said flanges including passages

leading into said aligned openings to permit the other bar to be disposed in said aligned openings and seated therein independently of said one bar, and portions of a frustoconically shaped



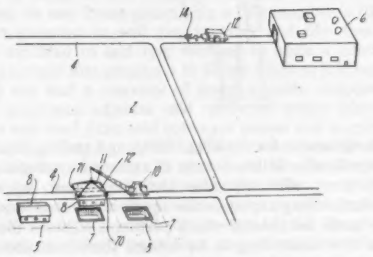
recess formed in said flanges in the region surrounding said aligned openings for readily receiving a reinforcing bar in said openings.

4,110,952

HOME BUILDING METHOD

Leon Blachura, Clarkston, Mich., assignor to North Oakland Development Corporation, Pontiac, Mich.

Filed Sep. 7, 1976, Ser. No. 720,690
Int. Cl.² E04H *1/12*
U.S. Cl. 52—745 **3 Claims**



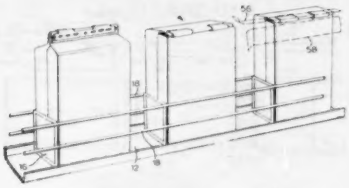
1. A method of building houses of framed construction in a factory and transporting the houses to points of use comprising fabricating each house on a plurality of jacks adjusted to provide a level support in the factory, each house when fabricated including a suitable number of laterally spaced lifting rods anchored at the bottom of the house walls and extending upwardly through the walls to a point above the roof of the house; providing a transporter with wheels; lowering the jacks to lower the house onto the transporter after completion of the house to provide a movable support for the house; moving the house to a point of use on the transporter; connecting the upper ends of the lifting rods to a lifting harness; lifting the house by a crane connected to the harness and lowering the house onto a foundation; and removing the lifting rods and harness from the house.

4,110,953

RECLOSABLE BAG CLOSURE SYSTEM

Gordon W. Holmes, Mississauga, Canada, assignor to Professional Packaging Limited, Mississauga, Canada

Division of Ser. No. 664,906, Mar. 8, 1976. This application Dec. 27, 1976, Ser. No. 754,115
Claims priority, application United Kingdom, Mar. 11, 1975, 10177/75
Int. Cl.² B65B *7/08, 7/04*
U.S. Cl. 53—419 **4 Claims**



1. A method for the formation of a closed, operable and reclosable bag structure, which comprises:

providing a bag having a generally rectangular base, generally rectangular front and rear walls upstanding from the integral with said base, generally rectangular side walls upstanding from said base and integral with said front and rear walls and said base, each of said side walls having a longitudinal fold line formed therein, and an open top,

placing articles to be packaged by said bag therein,

folding said side walls inwardly about said fold lines adjacent said open top,

bringing the front and rear walls into abutting relationship adjacent the top edges thereof to close the open top of said bag while simultaneously abutting the folded side walls adjacent the top,

folding a portion of said abutted faces downwardly and into abutting relationship with said front face, said portion corresponding in depth to approximately half the lateral dimensions of the base,

forming elongate thin strips of polymeric material,

die cutting a castellated shape longitudinally of said strip to separate the strip into two mirror image shaped strips,

forming an orifice through said strips adjacent each alternate valley of the strip,

separating the strips from each other,

folding the peak of each castellation of each separate strip towards the remainder of the separate strip to form for each peak a recess between the folded-over portion and the remainder of the strip,

separating individual elongate closure strips by cutting the strips transverse thereof in the alternate valley which does not have the orifice formed therethrough,

positioning the recess of an individual closure strip in interference fit relationship with said folded portion of said bag with said remainder of the strip abutting said folded over portion on the front face thereof,

applying adhesive to the exposed face of said remainder of said strip,

folding said folded over portion to bring said remainder of said strip into engagement with an adjacent portion of said front face to provide a top closure wall parallel to said base constituted by the upper portion of said rear wall,

curing said adhesive to achieve adhesive connection between said remainder of said closure and said engaged portion of said front face, and

recovering the bag structure so formed.

4,110,954
HORIZONTAL PACKAGING APPARATUS

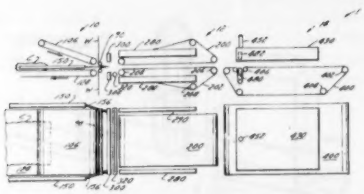
Jan Christer Holger Olsson, Braemhult, and Karl Gunnar Carlson, Vaestra Froelunda, both of Sweden, assignors to Tex Innovation AB, Goteborg, Sweden

Continuation-in-part of Ser. No. 735,551, Nov. 1, 1976, which is a continuation-in-part of Ser. No. 669,147, Mar. 22, 1976. This application Apr. 29, 1977, Ser. No. 792,348

Claims priority, application Canada, Mar. 30, 1977, 275130

Int. Cl.[2] B65B *31/02, 63/02, 9/02*

U.S. Cl. 53—433 **24 Claims**



17. A method of wrapping a commodity comprising the steps of supplying a commodity to be wrapped, supplying a pair of opposed lengths of wrapping material each having a pair of opposed free lateral edges, placing said opposed pair of lengths of wrapping material in registry, said lengths of wrapping material having a closed leading end, advancing said commodity along a fixed path into engagement with the wrapping material between the opposed sheets of wrapping material, sealing the free lateral edges of the sheets of wrapping material together to form an envelope having closed sides and a closed leading portion with said commodity therein, severing the opposed lengths of wrapping material across the width thereof to form a container length, and sealing the open trailing end to form a wrapped commodity enclosed in a wrapper.

4,110,955
INFUSION BAG AND METHOD OF PACKAGING INFUSION BAG

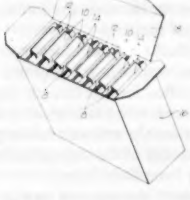
Adolf Rambold, Bachstrasse 8, Meerbusch 1, Fed. Rep. of Germany (4005)

Filed Jul. 1, 1976, Ser. No. 701,601

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1975, 2529429

Int. Cl.[2] B65B *5/06, 5/08, 7/26, 35/56*

U.S. Cl. 53—445 **3 Claims**



1. A method of packaging beverage infusion bags for tea and the like in horizontal, side-by-side relation comprising the steps of:

providing a plurality of infusion bags containing an infusion material, each bag having a top and a bottom, said top being reinforced by a flexible strip folded to form two wings attached to and encompassing the top of the bag, at least one of said wings extending the entire length of the bag from top to bottom and having a portion projecting beyond the bottom of the bag, the projecting portion having a free end;

providing a container for said infusion bags, said container having an opening on one side thereof and a container bottom on the side of said container opposite said opening;

allowing the infusion material to distribute toward the tops of the infusion bags by directing the tops of the bags downwardly; and

inserting said infusion bags into said container with the tops thereof confronting the bottom of said container, the bottoms of said infusion bags being adjacent said opening, and the free ends of the projecting portions being exposed and lying adjacent the bottoms of the infusion bags and the opening whereby the projecting portion of said one wing of each said infusion bags constitutes a pull strap adapted to be grasped to pull the infusion bag from said container such that said infusion bag inverts to a use position and the infusion material distributes over a greater area of the bag.

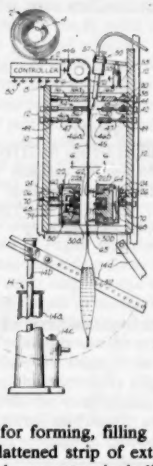
4,110,956
APPARATUS FOR FORMING, FILLING AND SEALING BAGS MADE FROM FLATTENED PLASTIC TUBULAR PLASTIC STOCK

Warren Weisberg, 2406 Grant, Evanston, Ill. 60201

Division of Ser. No. 747,199, Dec. 3, 1976, abandoned. This application Oct. 19, 1977, Ser. No. 843,477

Int. Cl.[2] B65B *9/10*

U.S. Cl. 53—558 **6 Claims**



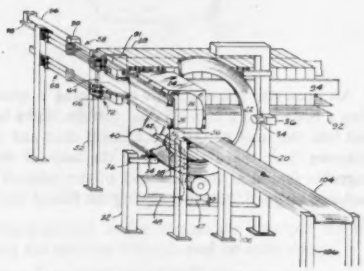
1. In apparatus for forming, filling and sealing bags made from a roll of a flattened strip of extruded synthetic plastic tubular stock, said apparatus including upper bag slitting means for forming a spout-receiving slit in a first portion of the tubular stock fed thereto which portion is adjacent the upper margin of a sealed bag to be formed therefrom, lower bag slitting means for forming a slit completely across the tubular stock in a second portion of the tubular stock which will constitute the bottom margin of a sealed bag being formed at a given time, wall separating means for spacing apart the confronting walls of the flattened tubular stock at and below the slit formed by said upper bag slitting means, filling means movable into and out of said slit formed in the tubular stock for filling the same with material, and means for forming seals completely across portions of the tubular stock to be positioned adjacent the upper and lower margins of a bag to be formed therefrom, the improvement comprising tubular stock advancing means for intermittently advancing an unwound portion of said roll of tubular stock in a downward direction to bring successive portions thereof into position to be operated upon by said bag slitting, wall spearating, filling and sealing means, said tubular stock advancing means comprising an upper pair of clamping means movable into and out of clamp-

ing relationship with flattened portions of said tubular stock at points adjacent to what will become the upper margin of a bag, said upper pair of clamping means engaging the tubular stock at points above the point where said slit is formed, and means following the insertion of said filling means into said tubular stock through said slit for bodily moving said upper pair of clamping means downwardly so the clamping means pulls the tubular stock downwardly to unroll said roll to tubular stock and advance the same at least one bag length, said upper pair of clamping means relieving said tubular stock at a point above said upper pair of clamping members from the weight of the material filling the portion of said tubular stock above the point where a seal is formed by said sealing means.

4,110,957
REVERSE WRAP

William G. Lancaster, 5101 Upper River Rd., Louisville, Ky. 40222, and Patrick R. Lancaster, 2906 N. Osage, Louisville, Ky. 41076

Continuation-in-part of Ser. No. 594,506, Jul. 9, 1975, abandoned. This application Oct. 7, 1976, Ser. No. 730,612
Int. Cl.² B65B *13/04*
U.S. Cl. 53—589 **23 Claims**

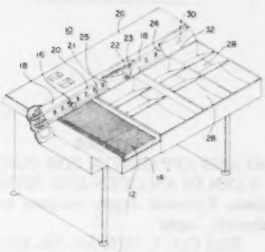


1. Apparatus for wrapping a plurality of loads and unitizing the loads into wrapped packages; comprising conveyor means adapted to receive a succession of loads; each said load comprising a plurality of members, wrapping apparatus positioned adjacent said conveyor means, said wrapping apparatus comprising a frame, a film material dispenser means rotatably mounted on said frame comprising a ring member, a film roll support mounted to said ring member and film tensioning means mounted to said ring member to place a continuous tension on said film causing it to be stretched as it is wrapped around the load a plurality of times, a guide wrapping rail means positioned adjacent said conveyor means adapted to receive said load from said conveyor means and support said load during wrapping, a film handling means positioned adjacent said guide wrapping rail means, said film handling means comprising clamp means adapted to hold film material from said film dispensing means in a fixed position while having the capability of severing said film material, said clamp means comprising two clamp assemblies, each clamp assembly comprising a lower bar member and an upper bar member configured to mate together and hold said film material therebetween with cutting means mounted to at least one of said members, said cutting means cutting said stretched material when said two members are mated together with said members holding one portion of said cut stretched material, mounted to said frame to activate and transport each of said bar members a predetermined distance into and out of the path of film dispensed by said dispenser means, said film dispenser means being adapted to hold film material and wrap said film material around said load, drive means engaging said ring member to drive said film member means in an alternating opposite direction after each wrap cycle so that in the first cycle stretched film material is wrapped around said load, supporting guide rail means and a first clamp assembly while being held by said first clamp assembly with trailing edge portion of said film being severed by a second clamp assembly forming a new leading edge portion which is held by said second clamp assembly, means to transport said wrapped load away from said wrapping apparatus after said first clamp assembly has been gapped, said film dispenser means in the subsequent wrapping cycle rotating in the opposite direction and wrapping a second load, said support guide rail means and said second clamp assembly with said first clamp assembly functioning in the identical manner as the second clamp assembly did in the previous wrap cycle.

4,110,958
EXTRACTION OF CONTENTS FROM ENVELOPES

Albert F. Stevens, 303 Somers Ave., Moorestown, N.J. 08057

Filed Apr. 11, 1977, Ser. No. 786,229
Int. Cl.² B65B *43/30*
U.S. Cl. 53—386 **9 Claims**



1. In a machine for facilitating the extraction of contents from an envelope and employing suction means for engaging the opposite sides of the envelope and for displacing at least one side to spread the envelope open, thereby also imparting to each side a first predetermined curvature:

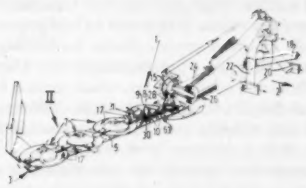
means for imparting to a portion of at least one of the sides a second curvature while the envelope is being spread open,

said second curvature being more pronounced and in the same direction as the first curvature imparted to that side.

4,110,959
MOWING DEVICE

Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed Nov. 2, 1976, Ser. No. 738,079
Claims priority, application Netherlands, Nov. 28, 1975, 7513926
Int. Cl.² A01D *55/18*
U.S. Cl. 56—295 **9 Claims**



1. A mowing device comprising a housing extending transversely of the direction of movement of said device, a plurality of shafts rotatably journalled in said housing and driving gear means arranged in said housing for driving the shafts each shaft projecting upwardly from said housing to present an exposed upper end, and a cutter member fixed to the upper end of each shaft, each cutting member comprising at least one lower ring

of substantially circular, uninterrupted circumference, skimming the top side of the housing, an upper ring covering the lower ring, means securing said upper and lower rings together as a unit and including at least one pin, and at least one cutter fastened at the circumference of the cutting member between the upper and lower rings by said pin and projecting radially beyond said lower ring, the cutters of neighbouring cutting members being relatively off-set in the circumferential direction, each upper ring being of irregular shape in plan view to expose at least that portion of the lower ring of each cutting member which is overlapped by the path of travel of each cutter of a neighbouring cutting member.

4,110,960

METHOD AND APPARATUS FOR PIECING-UP THE BROKEN YARN IN AN OPEN-END SPINNING SYSTEM

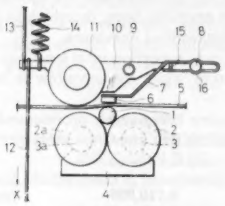
Kazuo Tsubata, Kyotoshi, Japan, assignor to Hironori Hirai, Nagaokakyoshi, Japan

Filed Oct. 7, 1974, Ser. No. 512,973

Claims priority, application Japan, Oct. 11, 1973, 48-115044

Int. Cl.[2] D01H *15/00, 1/12*

U.S. Cl. 57—34 R **4 Claims**



3. A method for piecing up the ends of yarn being spun by an open end spinning machine, which spinning machine includes a rotor, a yarn discharge tube, a winding drum and apparatus for piecing up the yarn ends, comprising an accelerator lever operably associated with the rotor for accelerating the rotor, a yarn gripping lever for holding the broken end of the yarn in a deviated state between the yarn discharge tube and the winding drum, a string operably associated with said accelerator lever and with said yarn gripping lever for controlling rotation of said rotor and release of said yarn by said gripping lever, and a positively revolved screw cylinder for holding the yarn in the deviated state for a predetermined time after the yarn is released from said gripping lever, which method for piecing up the ends of the yarn comprises the steps of driving the rotor of the open end spinning machine in an accelerating mode on actuation of the accelerator lever, holding a broken end of yarn in a deviated state between the yarn discharge tube and the winding drum of said open end spinning machine by means of the yarn gripping lever for a predetermined designated time after the start of acceleration of the rotor, which predetermined time is determined by the positively revolved screw cylinder, releasing the yarn end from the yarn gripping device after the predetermined time by means of the string and accelerator lever and introducing the yarn end into the discharge tube of the rotor after said predetermined time.

4,110,961

SPINNING UNIT OF AN OPEN-END SPINNING MACHINE

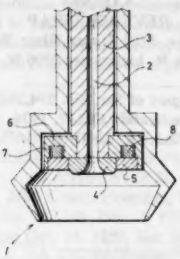
Josef Havel, Usti nad Orlici; Václav Vobornik, Letohrad; Josef Ripka, usti nad Orlici; Frantisek Jaros, Usti nad Orlici; Frantisek Hortlik, Usti nad Orlici; Agaton Plananský, Usti nad Orlici, and Bozena Rehackova, Usti n/Orl., all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 12, 1977, Ser. No. 841,603

Claims priority, application Czechoslovakia, Oct. 19, 1976, 6729-76

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.89 **7 Claims**



1. An open-end spinning unit comprising a spinning rotor having a body with a take-off duct therein, fibers being introduced into the inlet end of the take-off duct and yarn being withdrawn from the outlet end of the take-off duct, an exchangeable funnel at the inlet end of the take-off duct, and detachable magnetic means coupling the funnel with the body of the rotor.

4,110,962

FALSE TWISTING DEVICE

Friedrich Schuster; Max Thielemann, both of Hammelburg, and Otto Lang, Schweinfurt, all of Fed. Rep. of Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Mar. 16, 1973, Ser. No. 342,085

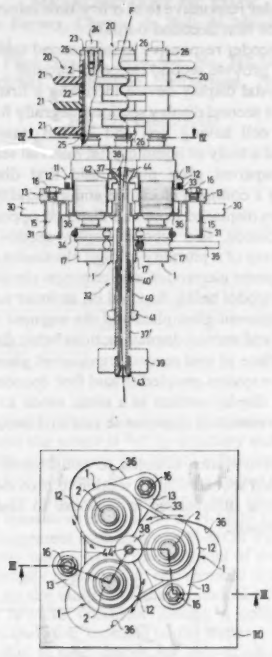
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1972, 2213147

Int. Cl.[2] D02G *1/00;* D01H *7/92*

U.S. Cl. 57—77.4 **30 Claims**

1. In an apparatus adapted for crimping synthetic threads or the like having three rotatably mounted adjustable spindles each provided with at least one rotationally symmetrical friction element, said spindles lying at the corners of an equilateral triangle in plan view and means for passing a thread which is to be false twisted between the friction elements in a zig-zag path, means for simultaneously adjusting all of said spindles with respect to the path of the thread with the spindles remaining at the corners of an equilateral triangle in plan view in all positions of adjustment with the center of the triangle lying on

the path of the thread, comprising means co-axial with respect to the path of the thread, for simultaneous adjustment of the



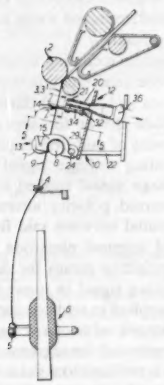
spindles, characterized in that means are provided for resiliently urging the spindles towards said co-axial means.

4,110,963

BREAK-OUT APPARATUS FOR FAULT PREVENTION IN THE PRODUCTION OF MULTI-STRAND YARNS

Dieter Erich Alexander Plate, Torquay, and John Desmond Feehan, Belmont, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed May 13, 1977, Ser. No. 796,790
Claims priority, application Australia, May 13, 1976, 5921/76
Int. Cl.[2] D01H *13/16*
U.S. Cl. 57—86 **19 Claims**



1. Apparatus for breaking out yarns having fewer strands than desired where two or more strands are combined into a yarn, said apparatus comprising a guide for constraining the combined strands laterally of their general direction of travel, the guide being mounted for lateral movement under pressure from a residual strand in the absence of the other to allow the residual strand to adopt a respective modified line of travel, and strand breaker means arranged to act on a strand adopting a said modified line of travel to effect breakout of that strand.

4,110,964

DRAW TEXTURIZING PROCESS

Albert H. Bruner, Pensacola, Fla., assignor to Monsanto Company, Decatur, Ala.

Continuation of Ser. No. 356,241, May 1, 1973, abandoned. This application Dec. 15, 1976, Ser. No. 750,744
Int. Cl.[2] D02G *1/02*
U.S. Cl. 57—157 TS **1 Claim**

1. In a draw-texturizing process for simultaneously drawing and texturizing thermoplastic synthetic yarn where the yarn is false-twisted and the false-twist is set in the yarn by means of heat, the improvement wherein the leading end of the yarn, while still undrawn, is pre-heated without substantial orientation drawing to a temperature just below its crystallization point before entering the draw-texturizing zone, said pre-heating being discontinued after a sufficient length of yarn has been pre-heated to effect string-up of the yarn.

4,110,965

SPUN-LIKE HAND YARN PROCESS

Bruce R. Bradley, Gulf Breeze; Larry D. Eckelman, and Donald G. Gilmer, both of Pensacola, all of Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 20, 1976, Ser. No. 752,238
Int. Cl.[2] D02G *1/02, 3/04*
U.S. Cl. 57—157 TS **5 Claims**

1. A process for making a yarn with a spun-like hand, comprising:

a. providing a feed yarn comprising first filaments having a given elongation to break and second filaments having a lower elongation to break

b. simultaneously drawing and false-twist heat-setting said feed yarn at a draw ratio selected to break no substantial number of filaments prior to passage through the false-twist device, and

c. increasing the tension on said yarn upon passage through said false-twist device to a tension level sufficient to break substantially only said second filaments, whereby the broken ends of said second filaments project outwardly from said yarn and portions of said second filaments inter-

mediate said broken ends are intermingled with said first filaments.

4,110,966

ELECTRONIC TIMEPIECE WITH STOP WATCH

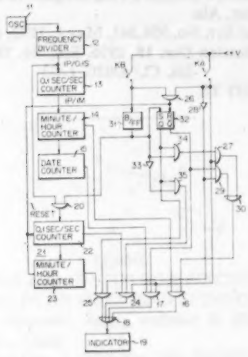
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,279

Claims priority, application Japan, Dec. 26, 1975, 51-158625; Dec. 26, 1975, 51-158638

Int. Cl.² G04F *3/06*

U.S. Cl. 58—4 A **8 Claims**



1. An electronic timepiece comprising a time data counting means for counting reference clock signals as time count data at all times; display means for displaying the time count data of said time data counting means; calendar data counting means for counting carry signals from said time data counting means; a display changeover switch operated to effect a switch from the time count data to a calendar data from the calendar data counting means so as to permit the latter to be coupled to the display means; time counting means provided independently of said time data counting means and said calendar data counting means and adapted to count reference clock signals; switch instruction means for giving a time count start instruction and time count stop instruction to said time count means; means for preferentially coupling the count value of said time counting means to said display means based on an instruction from said switch instruction means; detection means for detecting an in-operation state of said time counting means; and display control means for causing the counting value of said time count means to be switched to the time count data of said time data counting means for display on said display means when said display changeover switch is operated during the detection of the in-operation state by said detection means.

4,110,967

METHOD AND SYSTEM FOR DRIVING LIQUID CRYSTAL DISPLAY DEVICE

Hiro Fujita, No. 31-1-2-807, 1-chome, Sayamadai, Sayama-shi, Saitama-ken, Japan

Filed Aug. 31, 1976, Ser. No. 719,110

Claims priority, application Japan, Feb. 19, 1976, 51-17197; Jun. 2, 1976, 51-63545; Sep. 2, 1975, 50-106175

Int. Cl.² G04B *19/30*

U.S. Cl. 58—23 R **4 Claims**

1. An electronic timepiece comprising, in combination:

a frequency standard providing a relatively high frequency signal;

a frequency converter responsive to said relatively high frequency signal to provide a low frequency signal;

a first time counter responsive to said low frequency signal to provide a first time information signal; p1 a second time counter responsive to said first time information signal to provide a second time information signal;

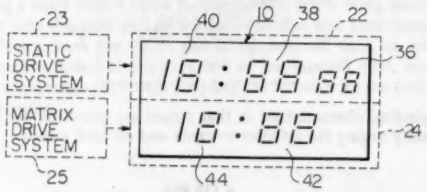
a first decoder responsive to said first time information signal to provide first decoded outputs;

a second decoder responsive to said second time information signal to provide second decoded outputs;

a liquid crystal display device including a first display section and a second display section integrally formed within a single cell having first and second transparent glass plates and a body of liquid crystal material sealed between said transparent glass plates, said first display section including a common electrode and a plurality of segment electrodes displaced from and disposed opposite the common electrode, said second display section including a matrix array of a plurality of digit electrodes and a plurality of segment electrodes, said common electrode and said digit electrodes being disposed on an inner surface of said first transparent glass plate and the segment electrodes of said first and second display sections being disposed on an inner surface of said second transparent glass plate;

a static drive system coupled to said first decoder for driving said first display section in a static mode to display first time information in response to said first decoded outputs; and

a matrix drive system coupled to said second decoder for driving said second display section to provide a display of second time information in response to said second decoded outputs;



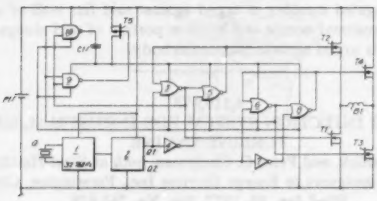
said matrix drive system including a digit electrode driver having circuit means for applying to said digit electrodes an alternating voltage signal varying in potential at first, second and third voltage levels, and a segment electrode driver having circuit means for applying to selected one of the segment electrodes of said second display section a segment drive signal varying in potential between said first and third voltage levels, whereby the root mean square value of a voltage applied across the digit electrodes and the segment electrodes of said second display section has a predetermined value to display said second time information; and

said static drive system including means for applying to said common electrode an alternating voltage signal varying in potential between said first and third voltage levels, and a segment electrode driver for applying to each of said segment electrodes of said first display section a reversed polarity alternating voltage signal exclusively of said alternating voltage signal applied to said common electrode, said reversed polarity alternating voltage signal varying in potential between said first and third voltage levels, and said segment electrode driver of said static drive system including means for delaying said reversed polarity alternating signal in phase from said alternating voltage signal applied to said common electrode whereby the root mean square value of a voltage applied across said common electrode and the segment electrode of said first display section is reduced to a value substantially equal to said predetermined value to provide a uniform display contrast between said first and second display sections.

4,110,968
CONTROL FOR A STEP MOTOR FOR THE MEASUREMENT OF TIME

Jean Claude Berney, Chemin du Bois de Menton, Epalinges, Switzerland

Filed Nov. 16, 1976, Ser. No. 742,524
Claims priority, application Switzerland, Nov. 18, 1975, 14900/75
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 A **3 Claims**

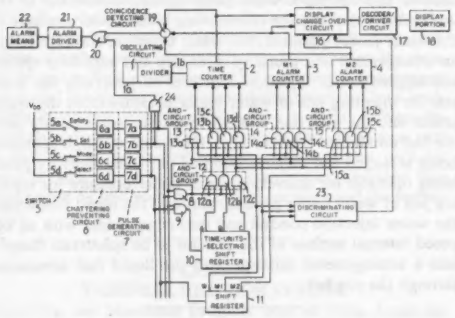


1. In a control circuit for a step motor in a horological device wherein the motor is fed by a battery and the circuit is provided with a reference oscillator, a frequency divider, a power stage and a shaper for delivering pulses to control the power stage, an improvement wherein said circuit comprises MOS power transistors exclusively of N-MOS type connected in paired arrangement such that one N-MOS transistor has an emitter directly connected to one terminal of the battery, and a collector directly connected to one terminal of the motor coil and directly to the emitter of the second N-MOS transistor, said second N-MOS transistor having a collector directly connected to the other terminal of the battery, and a voltage booster coupled to said shaper for delivering to the power transistors control pulses of a voltage much higher than the voltage of the battery.

4,110,969
DIGITAL ELECTRONIC ALARM TIMEPIECE

Takuro Fukuichi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Mar. 11, 1977, Ser. No. 776,892
Claims priority, application Japan, Mar. 11, 1976, 51/26286
Int. Cl.² G04B *23/12*
U.S. Cl. 58—57.5 **2 Claims**

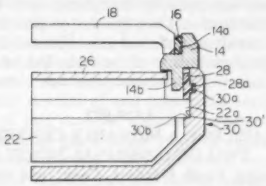


1. A digital alarm timepiece comprising standard signal generating means, circuit means for frequency-dividing the signal generated by said standard signal generating means, time counting circuit means for counting output signals of said dividing circuit means to provide a time signal, alarm time memory counting circuit means for setting a selected alarm time, display means for selectively displaying the time signal of said time counting circuit means and the set time of said alarm time memory counting circuit means, alarm sound generating means, coincidence circuit means for activating said alarm sound generating means upon occurence of coincidence between the set time of said alarm memory counting circuit means and the time signal of said time counting circuit means, manually operable switching means comprising a plurality of switches operable in selected different combinations to amend the count of said alarm time memory counting circuit means to set an alarm time and to amend the count of said time counting circuit means to correct the time signal provided thereby, each of said alarm time memory counting circuit means and said time counting circuit means comprising a plurality of counters, a first shift register controlled by said switching means to select which of said counting circuit means is to be amended, and a second shift register controlled by said switching means to select which counter of the selected counting circuit means is to be amended.

4,110,970
WATER-PROOF WATCH CASE

Masakazu Funazawa, Tokorozawa, and Osamu Matsumura, Chofu, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Nov. 3, 1976, Ser. No. 738,204
Claims priority, application Japan, Nov. 11, 1975, 50-152627[U]; Dec. 1, 1975, 50-162709[U]
Int. Cl.² G04B *37/08*
U.S. Cl. 58—90 R **17 Claims**



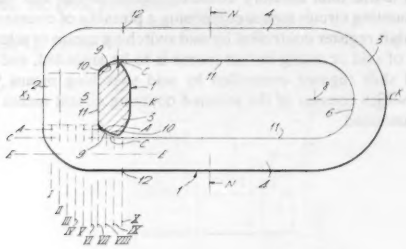
1. A water-proof watch case having a watch movement formed at its outer periphery with a flange, comprising:

a case body including an axially extending annular wall formed with a radially extending annular shoulder adapted to support the flange of said watch movement, and an inwardly facing annular recess formed on said annular wall;

a relatively hard, flexible sealing ring including an axially extending annular body held at its outer periphery in pressured contact with the annular wall of said case body, and an outwardly extending annular projection formed on the outer periphery of said annular body and engaging with the annular recess of said case body to prevent an axial displacement of said sealing ring relative to said case body, said annular body having a bottom end engaging with an upper surface of the flange of said watch movement to retain said flange in a fixed place on the annular shoulder of said case body; and

a bezel for receiving a glass plate and including a lower end formed with a downwardly extending annular portion press-fitted to and compressing said sealing ring against the annular wall of said case body to provide a water-tight sealing effect therebetween.

4,110,971
LINK CHAIN
Peter Bruce, "Le Victoria", App. 5e - etage, Bloc D, 13 bd., Princesse Charlotte, M.C., Monaco
Filed Feb. 3, 1977, Ser. No. 765,523
Claims priority, application United Kingdom, Feb. 4, 1976, 4311/76
Int. Cl.² F16G 15/12
U.S. Cl. 59—84 9 Claims

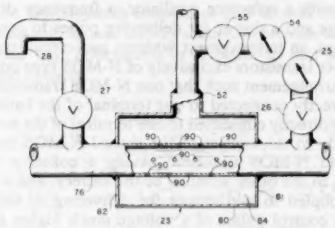


1. A link chain comprising a plurality of links joined together in sequence, each link including a closed member comprising a pair of facing U-shaped portions joined by substantially parallel leg portions, the base of the U at the link end of one of a pair of joined links having a portion of its inside surface as a part convex cylindrical surface while the associated link end of the other link has a portion of its inside surface as a part concave cylindrical surface, the two part cylindrical surfaces mating with each other when the chain is straight under tension, while permitting relative pivoting of the joined links about a first axis substantially transverse to the longitudinal mid plane of one link of the pair, the part-cylindrical convex surface of said one link end having arcuate shoulder portions blending into the parallel leg portions of the link and said part-cylindrical concave surface of said associated link end having arcuate side wall portions substantially complementary to the arcuate shoulder portions of said one link end to permit relative pivoting of the links about a second axis substantially transverse to the longitudinal mid-plane of the other link of the pair.

4,110,972
SEAL MEANS FOR A MOVABLE CENTERBODY IN A TWO DIMENSIONAL NOZZLE
John H. Young, South Windsor, Conn., and Gerald F. Goetz, Seattle, WA, assignors to United Technologies Corporation, Hartford, Conn.
Filed Dec. 16, 1976, Ser. No. 751,428
Int. Cl.² F02K 1/12, 11/04
U.S. Cl. 60—230 10 Claims

1. For aircraft, in combination, a two-dimensional nozzle exhausting the products of combustion manifested by the aircraft's engine, a pivotable wedge centerbody having collapsible walls to vary its orientation in said nozzle and change the geometry thereof, a source of cooling air and means interconnecting the cavity of said centerbody with said source, sealing means for preventing the inclusion of products of combustion internally of said centerbody and the leakage of cooling air contained within said centerbody cavity, said sealing means including a pair of laterally spaced elongated members movably supported to the lateral edges of said centerbody adjacent the flat side wall of said two-dimensional nozzle defining therewith an open ended channel, means for communicating cooling air to pressurize said open ended channel so that one portion of said elongated member is urged against said flat wall of said two-dimensional nozzle and another portion of said elongated member is urged against said centerbody.

4,110,973
WATER INJECTION SYSTEM FOR INDUSTRIAL GAS TURBINE ENGINE
Jack Haeflich, and Peter C. Christman, both of West Hartford, Conn., assignors to Energy Services Inc., Farmington, Conn.
Filed Jan. 24, 1977, Ser. No. 761,628
Int. Cl.² F02C 7/22
U.S. Cl. 60—39.05 4 Claims

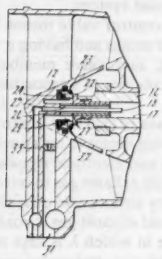


1. In a gas turbine engine water injection system having a water delivery pump for delivering water under pressure and a water injection device mounted in series with a liquid fuel delivery conduit of the engine and connected to the water delivery pump for injecting water into the liquid fuel as it is conducted to the engine, the improvement wherein the water injection device comprises a water injection conduit connected in series with the liquid fuel delivery conduit, a water jacket defining a water chamber surrounding the water injection conduit and having a water inlet conduit connected to the water delivery pump for transmitting water under pressure to the water jacket chamber, the water injection conduit having an arrangement of a plurality of axially and angularly spaced non-aligned water injection apertures of generally the same size for injecting jets of water under pressure from the water jacket into the injection conduit to mix homogeneously with the fuel conducted therethrough, the water injection apertures being arranged and dimensioned and the water delivery pump being operable for delivering water under pressure for injecting jets of water under pressure through the liquid fuel within the water injection conduit and into engagement with an opposed internal surface of the conduit to be splattered thereby into a homogeneous mixture with the liquid fuel conducted through the conduit.

4,110,974
GOVERNOR
Gerald J. Herman, Farmington Hills, Mich., assignor to Williams Research Corporation, Walled Lake, Mich.
Filed Dec. 22, 1976, Ser. No. 753,203
Int. Cl.² F02C 7/22
U.S. Cl. 60—39.28 R 11 Claims

1. An engine fuel governor comprising
a stationary member having a fuel inlet,

means for pressurizing said fuel inlet,
a shaft having a bore,
means connecting said shaft to said engine so as to rotate at a speed proportional to engine speed,
at least one slot extending from the outer shaft surface to said bore,



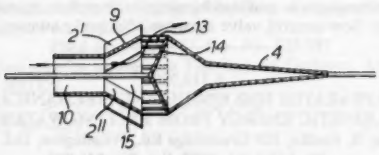
passageway means leading from said fuel inlet to the outer end of said slot, whereby the centrifugal force of fuel in said slot will partially counteract the fuel inlet pressure,
and fuel passageway means leading from said shaft bore to said engine.

4,110,975

JET ENGINE HAVING COMBUSTION CHAMBER WITHIN COMPRESSOR

Magne Godtland, 2500 Tynset, Norway

Filed Jan. 25, 1977, Ser. No. 762,797
Claims priority, application Norway, Jan. 27, 1976, 760256
Int. Cl.[2] F02K *3/02*
U.S. Cl. 60—262 **5 Claims**



1. Jet engine, comprising a long, tube-shaped casing, open at both ends, a shaft supported centrally in the casing, a compressor and gas turbine rigidly connected to said shaft, and a combustion chamber with fuel supply located between the compressor and turbine, characterized by two coaxial compressors with radial blades, the compressors being separated by a backwardly-diverging, conical partition, by a radial turbine disposed immediately back of the compressor in connection with the back end of the conical partition, and by a rear wall disposed in back of the turbine, the combustion chamber then being bound by said wall, said conical partition and the turbine blades.

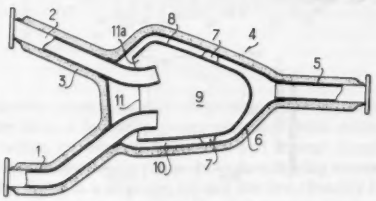
4,110,976

THERMAL REACTOR SYSTEM

Hiroo Oya, and Masakazu Tatejima, both of Ohta, Japan, assignors to Fuji Heavy Industries Limited, Tokyo, Japan

Filed Oct. 5, 1976, Ser. No. 729,684
Claims priority, application Japan, Oct. 7, 1975, 50-136781[U]
Int. Cl.[2] F01N *3/10, 7/10*
U.S. Cl. 60—282 **5 Claims**

1. A thermal reactor system for an internal combustion engine comprising
a first exhaust pipe communicating with exhaust ports of the engine and having an opening,
a thermal reactor communicating with said first exhaust pipe,
a second exhaust pipe operatively communicating with said thermal reactor,
said thermal reactor comprising,
an outer shell covered by an insulating material,
an inner shell having substantially the same shape as but smaller than that of said outer shell and being disposed in said outer shell spaced therefrom defining an exhaust passage therebetween,
projections between said inner and outer shells supporting said inner shell spaced from said outer shell and defining said exhaust between said outer shell and said inner shell,
said inner shell defining a reaction chamber of substantially convex shape including an inlet-outlet section, and an intermediate section having a progressively narrowing substantially conical shape, and an innermost end section having a substantially convex shape, respectively,



said inlet-outlet section of said inner shell being formed with an outlet opening of said reaction chamber spaced opposite from said innermost end section and communicating with said exhaust passage,
said first exhaust pipe being inserted into said reaction chamber passing through said outlet opening defining an outlet thereof therearound,
said second exhaust pipe communicating with said exhaust passage at a position on the opposite side of said innermost end section from said inlet-outlet section, and
said first exhaust pipe having an end portion adjacent said opening thereof and being oriented substantially parallel to an adjacent portion of said inlet-outlet section of said inner shell of said reaction chamber, whereby for each portion of exhaust gas a single swirl of exhaust gases is produced in said reaction chamber starting from an opening of said first exhaust pipe and ending completely feeding into said outlet of said reaction chamber

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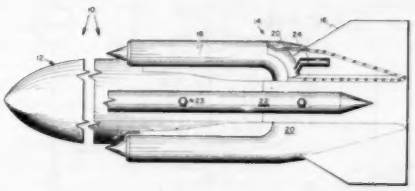
4,110,977

PYROGEN IGNITER RAMJET IGNITION SYSTEM

Frank W. Jandl, Orange, Calif., and Gregory D. Colman, DeRidder, La., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 13, 1977, Ser. No. 806,210
Int. Cl.[2] F02K *7/10*
U.S. Cl. 60—270 R **11 Claims**



1. In a ramjet engine comprising,
a. a combustion chamber;
b. a plurality of ram air tubes each having an aft end commu-

nicating with said combustion chamber and a forward open end for air intake;

c. means for introducing fuel into each said ram air tube at a point intermediate said ends; and

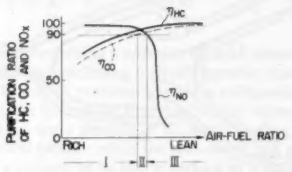
d. igniter means associated with at least one said ram air tube and being effective, when operated, to inject a flame into said one tube intermediate said point and said aft end sufficient to cause burning of the fuel air mixture passing from said ram air tube into said chamber.

4,110,978

APPARATUS FOR PURIFYING EXHAUST GAS

Torazo Nishimiya, Mito; Yoshishige Oyama, Katsuta, and Ryoichiro Oshima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 30, 1976, Ser. No. 745,999
Claims priority, application Japan, Dec. 5, 1975, 50-144006
Int. Cl.[2] F02D *75/10*; F07D *35/00*; F02M *7/00*
U.S. Cl. 60—276 **3 Claims**



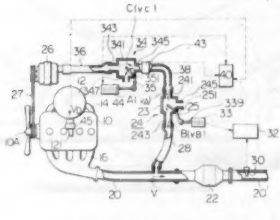
1. An apparatus for purifying exhaust gas by a single three-functional catalyst capable of oxidizing hydrocarbons and carbon monoxide and simultaneously reducing nitrogen oxides provided in an exhaust gas line, which comprises a fuel-controlling means for dividing driving conditions into an accelerating stage as zone I, a steady running stage as zone II, and a slowing-down and idling stage as zone III, and controlling an air-fuel mixture to be fed from a carburetor to a reducing state of the three-functional catalyst in zone I, a three-functional state thereof in zone II, and an oxidizing state thereof in zone III.

4,110,979

APPARATUS FOR INTRODUCING SECONDARY AIR INTO AN EXHAUST SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Hideo Miyagi; Kiyohiko Oishi; Yasuhiko Ishida, all of Susono, and Shunzo Yamaguchi, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippon Soken, Inc., Nishio, both of, Japan

Filed Dec. 2, 1976, Ser. No. 746,869
Claims priority, application Japan, Aug. 17, 1976, 51-97424
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—276 **8 Claims**



1. An apparatus for introducing secondary air into an exhaust system of an internal combustion engine provided with a three-way catalytic converter arranged in said exhaust system, said apparatus comprising:

pipe means connected to said exhaust system at a position located upstream of said three-way catalytic converter;

air introducing means provided on said pipe means for introducing air into said pipe means;

means for sensing an atmosphere of said exhaust gas arranged in said exhaust system in order to provide electrical signals indicating an excess air ratio of said exhaust gas in said exhaust system;

first air flow control valve means having a casing arranged on said pipe means and having a valve member disposed in said casing, said valve member being moved so as to control an amount of a secondary air passing through the casing;

actuating means of said first control valve means connected to said sensing means to move said valve member in accordance with said electrical signals indicating said excess air ratio λ of said exhaust gas to introduce a necessary amount of secondary air into said exhaust system so that the atmosphere of said exhaust gas is controlled to a stoichiometric atmosphere in which λ is kept near 1.0;

second air flow control valve means having a casing arranged in said pipe means at a position located upstream of said first air flow control valve means remote from said exhaust system, and having a valve member which is capable of being moved so as to control the amount of secondary air introduced into said first air flow control valve means, and;

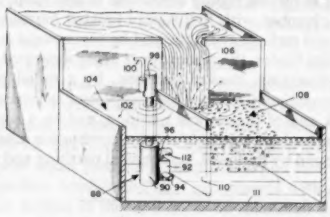
operating means of said valve member of said second air flow control valve means for moving said valve member for controlling the amount of secondary air introduced into said exhaust system in accordance with the amount of fluid passing through the engine passageways including the intake system and said exhaust system, so that the ratio of the amount of the air introduced into said first air flow control valve means to said necessary amount of air introduced into the engine exhaust system is kept approximately near to a predetermined value which is larger than 1.0, whereby a precise control of the atmosphere of the exhaust gas to said stoichiometric atmosphere by said first air flow control valve means is effectively attained.

4,110,980

APPARATUS FOR PRODUCING MECHANICAL KINETIC ENERGY FROM FALLING WATER

Willing B. Foulke, 109 Greenridge Rd., Wilmington, Del. 19805

Filed Oct. 13, 1977, Ser. No. 841,823
Int. Cl.[2] F16D *33/00*
U.S. Cl. 60—325 **12 Claims**



1. Apparatus for producing mechanical kinetic energy from falling water comprising:

a body of water having a surface;

means, comprising a stream of water falling downwardly into and agitating said surface, for inducing air bubbles in a portion of said body of water and carrying said bubbles through a substantial distance below the surface thereof; and

motor means communicating with said portion of said body of water and responsive to the potential energy of the air bubbles in said first portion of said body of water, to produce mechanical kinetic energy.

4,110,981

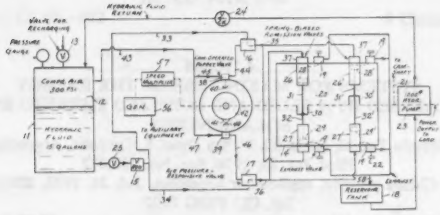
HYDRAULIC MOTOR WITH AIR DISTRIBUTOR-OPERATED VALVES

John R. Murphy, Hwy. 278 East, Amory, Miss. 38821

Filed Aug. 17, 1977, Ser. No. 825,462

Int. Cl.² F15B *11/20*

U.S. Cl. 60—371 **14 Claims**



1. In a hydraulic fluid engine system, a sealed liquid storage tank having a first space containing hydraulic liquid and a second space containing compressed air pressurizing said liquid, an engine provided with opposed cylinders containing pistons and a crankshaft having crank elements connected to said pistons, liquid conduit means connecting said first space of the storage tank to said cylinders and including respective compressed air-operated pilot valves for admitting pressurized liquid to said cylinders, and distributing air conduit means alternately operatively connecting said compressed air second space to said pilot valves responsive to rotation of the crankshaft.

4,110,982

AUXILIARY DRIVE ASSEMBLY FOR ACCELERATING A VEHICLE

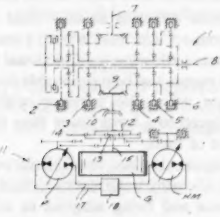
Karl-Nikolaus Regar, Munich, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 18, 1977, Ser. No. 825,797

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637322

Int. Cl.² F15B *1/02*

U.S. Cl. 60—413 **3 Claims**



1. An auxiliary drive assembly for accelerating a vehicle having a drive shaft and a driven shaft, said auxiliary drive assembly comprising:

(a) a flywheel,

(b) first and second adjustable hydraulic motor/pump units and means for hydraulically coupling said units to each other,

(c) summation gearing having a first input connected to said flywheel and to said first motor/pump unit, a second input connected to said second motor/pump unit, and an output from which power can be released,

(d) means for connecting said summation gearing output to the drive shaft for driving the latter or charging said flywheel, and

(e) a brake in said second motor/pump unit for effecting rapid charging of said flywheel by the drive shaft.

4,110,983

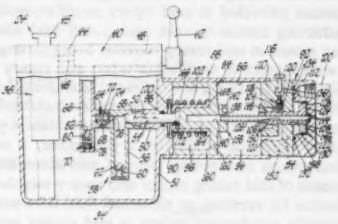
AIR OPERATED HYDRAULIC PUMP APPARATUS

Clarence A. Sherman, Birmingham, Mich., assignor to Terry McDermid, Southfield, Mich.

Filed Jun. 13, 1977, Ser. No. 805,680

Int. Cl.² F16D *31/02*; F15B *13/09*

U.S. Cl. 60—477 **10 Claims**



1. Hydraulic pump apparatus comprising: a housing defining a cylinder bore; a hydraulic pump actuating piston sealingly slidable within the bore to define first and second chambers whose sizes change during piston movement; spring means for biasing the piston in a direction toward the first chamber from the second chamber; a valve having a first position for feeding compressed gas to the first chamber to move the piston against the bias of the spring means; said valve being movable to a second position to terminate the supply of compressed gas to the first chamber and concomitantly communicate the first chamber to the environment to permit the bias of the spring means to move the piston; a first actuator for moving the valve from the first position to the second position upon a predetermined extent of piston movement against the spring means; and a second actuator for moving the valve from the second position back to the first position upon a predetermined extent of piston movement under the bias of the spring means, whereby the piston reciprocates within the bore as the valve is moved between the first and second positions in response to piston reciprocation.

4,110,984

ROTARY PISTON ENGINE USING ELECTRIC HEATING TO FLASH MOTIVE FLUID

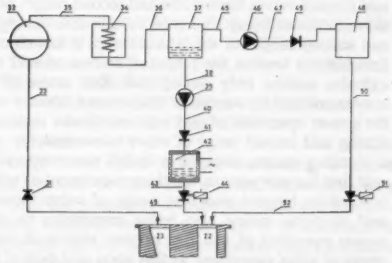
Rolf Schneider, im Sellhof 560, 8215 Hallau, Switzerland

Filed Mar. 15, 1977, Ser. No. 777,854

Claims priority, application Switzerland, Jun. 22, 1976, 007984/76

Int. Cl.² F01C *21/12*; F01K *25/06, 25/12*

U.S. Cl. 60—509 **11 Claims**



1. A machine operable according to the gas discharge princi-

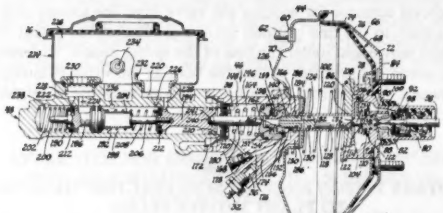
ple, comprising a fixed housing including a shaft, said housing having side walls and a casing surrounding peripherally said side walls, a rotary member secured for rotation on said shaft in said housing in an eccentric fashion, said rotary member comprising a plurality of projections, said projections during the rotation being in continuous sliding contact with the inner surface of said casing and sliding along said inner surface during rotation, said rotary member during rotation forming a plurality of operating chambers having each a variable volume, further including a guide means fixed on said rotary member and a mating guide means fixed on said shaft for guiding said rotary member, a plurality of electrically conducting means provided in said casing of said housing, an electrically conducting means provided in said rotary member, said electrically conducting means in said casing and said electrically conducting means in said rotary member being arranged lying opposite with respect to each other when said rotary member is mounted in said housing for rotation, said electrically conducting means in said casing and said rotary member having a predetermined distance with respect to each other in predetermined rotary positions of said rotary member, a source of voltage and means connecting each of said electrically conducting means of said casing and of said rotary member to said voltage source for creating an electrical field between respective electrically conducting means in said casing and in said rotary member at a predetermined sequence, and a closed circuit coupled to said housing for supplying thereto an operating medium in a predetermined quantity and at predetermined instant.

4,110,985

DUAL POWER BRAKE BOOSTER

Ralph A. Gordon, Centerville; Thomas P. Mathues, Miamisburg, and Donald L. Parker, Middletown, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 9, 1976, Ser. No. 675,497
Int. Cl.² B60T *13/12*
U.S. Cl. 60—548 **3 Claims**



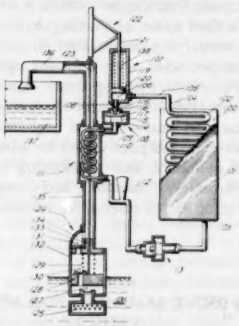
1. A brake booster and master cylinder assembly comprising:
first and second independently power operable booster sections and a master cylinder section in operative series relation;
manual force input means movable to control the separate actuation of said booster sections and including axially movable control valves for each of said booster sections, said control valves having first and second ranges of valve movement and being concurrently movable through first and second ranges of valve movement to condition said first booster section for power operation of said master cylinder section only during said first range of valve movement and to condition said second booster section for power operation of said master cylinder section only during said second range of valve movement;
and blocking means, responsive to full power operation of said first booster section, blocking movement of said control valves beyond said first range of valve movement, said blocking means also being responsive to lack of power operation of said first booster section in said first range of valve movement so that upon said lack of power operation said blocking means permits movement of said control valves through said second range of valve movement.

4,110,986

SYSTEMS FOR MAKING USE OF THE ENERGY CARRIED BY A FLUID AND SUPPLIED THERETO BY SOLAR ENERGY

Victorio Tacchi, Rioja 50, 1°Piso Dpto. 1, Cordoba, Argentina

Filed Jul. 23, 1976, Ser. No. 708,071
Claims priority, application Argentina, Jul. 24, 1975, 259738
Int. Cl.² F03G *7/02*
U.S. Cl. 60—641 **13 Claims**



1. An apparatus operable by solar energy for heating a fluid and causing it to flow, said apparatus comprising:
a solar energy receiving panel having a solar energy receiving surface for converting solar energy into heat;
conduit means having a fluid inlet and a fluid outlet operatively associated with said panel for conducting the fluid and for transferring heat generated at said surface to said fluid;
first valve means attached to said fluid inlet and being adapted to connect said fluid inlet to a source of fluid, said first valve means allowing unidirectional fluid ingress into said conduit means and being movable from a closed to an open position when the pressure within said conduit means is reduced to a level lower than the pressure level of the source of fluid;
second valve means attached to said fluid outlet, said second valve means allowing unidirectional fluid egress from said conduit means and being adapted to connect said fluid outlet to a receiving space for receiving fluid egressing from said conduit means, said second valve means being movable from a closed position to an open position when the pressure caused by the expansion of said fluid within said conduit means exceeds a predetermined level, said second valve means remaining in said open position while the pressure within said conduit means falls below said predetermined level, said second valve means being adapted to be moved from said open position to said closed position after the pressure within said conduit means falls below the pressure within the source of fluid, said second valve means being prevented from moving from said open to said closed position by the combined pressure and inertial force of fluid flowing along said conduit means and through said second valve means.

4,110,987

THERMAL ENERGY STORAGE BY MEANS OF REVERSIBLE HEAT PUMPING UTILIZING INDUSTRIAL WASTE HEAT

Robert P. Cahn, Millburn, and Edward W. Nicholson, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Mar. 2, 1977, Ser. No. 773,705
Int. Cl.[2] F01K 3/00
U.S. Cl. 60—652 8 Claims

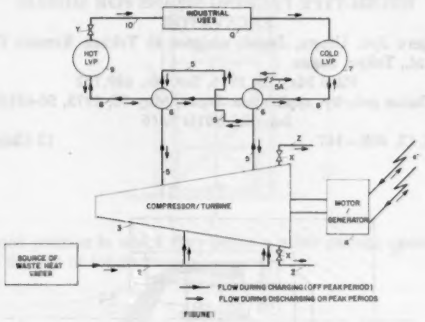


FIGURE 1

1. In a process for storing the off-peak electrical output of an electricity generating plant in the form of heat in a low vapor pressure (LVP) organic heat retention material and recalling said heat from said LVP organic heat retention material during period of peak power demand by reconversion into electrical power or utilization as high quality process heat comprising the steps of:

(a) using excess electrical power to run a compressor;

(b) compressing a low level heat containing vapor to raise the temperature of said heat containing vapor;

(c) contacting said high temperature heat containing vapor through heat exchanger means with an LVP material;

(d) storing said hot LVP material in isolation from the atmosphere at atmospheric pressure;

(e) during periods of peak power demand using said stored hot LVP material as fluid heat transfer medium in industrial applications;

the improvement comprising using as the low level heat containing vapor in step (b) the waste heat containing vapor generated by industrial and/or municipal installations.

4,110,988

METHOD FOR FORMING DOMES FROM SUBTERRANEAN DIAPIRIC MATERIAL

Charles L. Hyder, 1007 Acequia Trail, Albuquerque, N. Mex. 87107

Filed Oct. 25, 1977, Ser. No. 844,626
Int. Cl.[2] E02D 27/28
U.S. Cl. 405—131 2 Claims

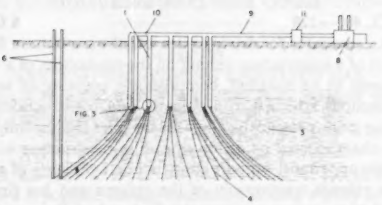


FIG. 3

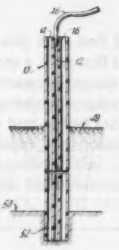
1. Method for forming synthetic domes from subterranean diapiric material, especially salt which comprises: drilling a series of continuous wellbores, each having a first section drilled vertically from the ground surface to a depth wherein underlying subterranean strata of diapiric material is penetrated; and one or more second sections connected to each first section, said second sections emanating radially from the area of the desired dome and said second section gradually curving downward and outward from the first section in the strata of diapiric material; and a vertical exhaust section connecting the distal end of each second section to the surface; inserting sealed well casing within said wellbores and circulating a heating fluid through the well casing transferring heat to the strata of diapiric material thereby reducing the viscosity of the diapiric material increasing the pressure in the diapiric material, thereby rendering the diapiric material mobile and causing it to flow to create a dome.

4,110,989

PILING FABRICATED FROM SYNTHETIC MATERIAL

Thomas Selkirk, 61 Dictum Ct., Brooklyn, N.Y. 11229

Filed May 16, 1977, Ser. No. 797,299
Int. Cl.[2] E02D 5/32
U.S. Cl. 405—248 7 Claims



1. A piling comprising a cylindrical, one-piece, elongated body portion having a uniform cross section throughout its length; said body portion consisting of a non-corrosive, acid resistant, synthetic material; said body portion having a smooth and uniform exterior surface; a longitudinal bore extending through said body portion; said bore providing a column of air space walled by said synthetic material of said body portion; means for introducing a fluid under pressure through said bore to facilitate sinking a lower end of said body portion into a bed; a plurality of longitudinal passageways extending through said body portion; said passageways being positioned around said bore; said passageways providing additional columns of air space walled by said synthetic material of said body portion; and cover means sealing upper ends of said bore and passageways for trapping said columns of air space within said bore and passageways to retain said body portion in the bed, whereby any attempt to extract said piling from its position in the bed is met by a resistance to form a vacuum within said bore and passageways which are sealed by said cover means at one end and the bed at an opposite end thereof.

4,110,990

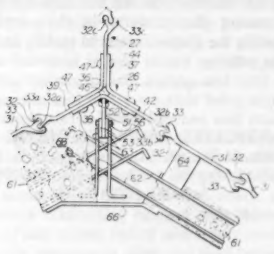
METHOD AND STRUCTURE FOR REHABILITATING SHEET PILE CELLULAR COFFER DAMS

Isadore Thompson, and Rudolph Fehr, both of 133 Kearney St., San Francisco, Calif. 94108

Filed Sep. 6, 1977, Ser. No. 830,409
Int. Cl.[2] E02D 5/60
U.S. Cl. 405—14 14 Claims

1. A coffer dam repair structure comprising a first arch having a plurality of vertically disposed sheet piles formed edge to edge and extending into the soil, each said pile having cooperating means on each vertical edge to connect said vertical edge to the vertical edge of an adjacent pile, a second arch adjacent said first arch having a plurality of piles formed and connected similar to the piles of said first arch, a diaphragm

extending generally transverse to said first and second arches from the line of intersection of said arches, said diaphragm having a plurality of piles formed and connected similar to the piles of said first arch, a Y-shaped vertical joint joining together adjacent vertical edges of said first arch, second arch and diaphragm, a vertical plate secured to said vertical joint in alignment with said diaphragm and extending directly away from said diaphragm, a first repair arch generally similar in



area to the area of said first arch placed above the soil and spaced outwardly of said first arch, a second repair arch similar to said first repair arch spaced outwardly of said second arch, and attachment means connecting the continuous edges of said repair arches to each other and to said vertical plate, whereby the components of force on said repair arches are balanced laterally perpendicular to said diaphragm and are resisted in an outward direction parallel to said diaphragm by said diaphragm.

4,110,991

PREPARING TUBING OR PIPELINES FOR SUBMARINE INSTALLATION

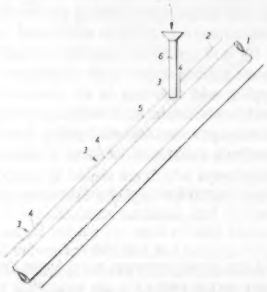
Joachim Torkuhl, Korschenbroich-Herrenshof, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 7, 1977, Ser. No. 757,560

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1976, 2600519

Int. Cl.² F16L *58/06*

U.S. Cl. 405—157 **5 Claims**



1. Method of preparing tube or pipelines for installation on the bottom of the sea, lakes, rivers, etc., comprising:

providing a flexible hose around the pipe or tube to be installed;

winding at least one wire or cable around the tube, the wire or cable being provided with spacers which are being placed onto the tube for holding the wire or cable in spaced-apart relation to the tube, the cable or wire being located inside of the hose;

filling fresh concrete in steps into a space as provided between the hose and the pipe or tube, prior to submarine installation; and

winding cable or ropes helically around the hose subsequently to the filling step for establishing concrete cushions, but also prior to submarine installation.

4,110,992

BRUSH-TYPE PACKING MEANS FOR SHIELD EXCAVATOR

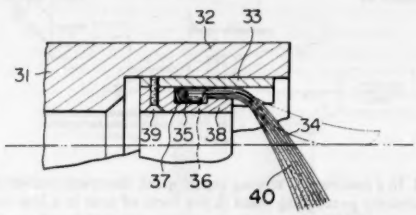
Shigeru Jyo, Urawa, Japan, assignor to Tekken Kensetu Co. Ltd., Tokyo, Japan

Filed May 25, 1976, Ser. No. 689,722

Claims priority, application Japan, May 30, 1975, 50-64166

Int. Cl.² E01G *5/16*

U.S. Cl. 405—147 **12 Claims**



1. A brush-type packing means for shield tunnel excavators comprising a substantially ring-shaped brush of bunched wires having a high resiliency and wear resistance, said ring-shaped brush being secured along the inner periphery of a substantially cylindrical excavator body adjacent the tail end thereof and projected inward at its free end, and means for securing said brush to a position for closing a gap between a tunneled ground surface and the peripheral surface of a tunnel wall element inserted in the excavated tunnel, clearances between said bunched wires being sealed with an impregnating agent deformable and impermeable to water, said impregnating agent being substantially filled in said brush wire clearance while being in a liquid state and thereafter set at the normal temperature providing a resiliency.

4,110,993

APPARATUS FOR DRIVING PILES

Pieter Schelte Heerema, Kapellen, Belgium, assignor to Panama Overseas Shipping Corporation Inc., Panama, Panama

Filed Jul. 5, 1977, Ser. No. 812,976

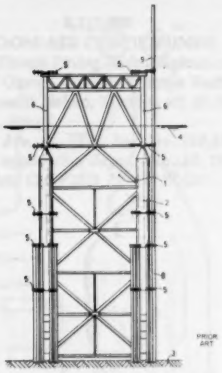
Claims priority, application Netherlands, May 9, 1977, 7705067

Int. Cl.² E02D *13/04;* E02B *17/00*

U.S. Cl. 405—228 **6 Claims**

1. An apparatus for driving piles into the sea-bottom for the support of a substructure resting on the sea-bottom of a working island to be installed, comprising a plurality of support constructions attached to a column, said constructions each defining guide passage openings for the piles and the followers, and a chain located on a ship or on the substructure itself, at least the uppermost support construction consisting of an arm which extends transversely of the column and has first and second ends, means securing the first end of the arm to the column to enable the arm to pivot about a vertical axis, a first semi-circular claw segment secured to the second end of the arm, a second semi-circular claw segment, and means securing the second claw segment to said second end of the arm to

permit pivotal movement thereof with respect to the first claw segment, whereby the claw segments can be brought into a



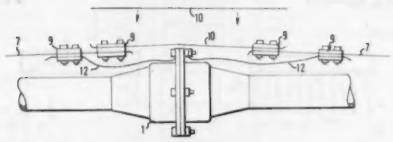
closed position in which they define a guide passage opening for the pile or follower.

4,110,994

MARINE PIPELINE

Roy Walfrid Lundh, Glendora, Calif., assignor to Poseidon Marketing and Development Co., Arcadia, Calif.

Division of Ser. No. 652,281, Jun. 26, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 853,010
Int. Cl.² F16L *1/00*
U.S. Cl. 405—158 **14 Claims**



1. A marine pipeline comprising
a plurality of flexible pipe sections coupled together,
cable means extending along the coupled pipe sections,
a plurality of snubber means spaced apart along the pipe sections and so fixed to the cable means and the pipe sections that when the cable means is in tension the pipe sections are slack,
buoyancy means tending to cause the pipe sections to float, and
a plurality of anchor means spaced apart along the pipe sections and the cable means to anchor the sections at a depth between the sea bed and its surface, the length of coupled pipeline sections being greater than that required for a direct course to enable portions of the pipeline to be on the surface without the pipeline being interrupted.

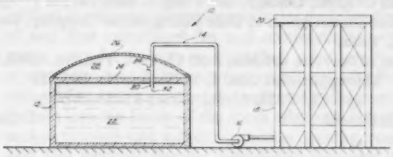
4,110,995

SYSTEM FOR STORING LIQUIFIED GAS

Tadeusz J. Marchaj, Port Washington, N.Y., assignor to Preload Technology, Inc., Garden City, N.Y.

Filed Apr. 6, 1977, Ser. No. 785,108
Int. Cl.² F17C *13/00*
U.S. Cl. 62—50 **14 Claims**

5. In a cryogenic storage system for storing a body of liquified gas having an insulated reservoir for the storage of liquified gas, a reservoir for gas vaporized from said body of liquified gas isolated from said insulated reservoir and a vaporized gas withdrawal line for selective removal of vaporized gas from the system, the improvement comprising means within said system providing communicative means between said gas withdrawal line and said reservoir for vaporized gas to exhaust



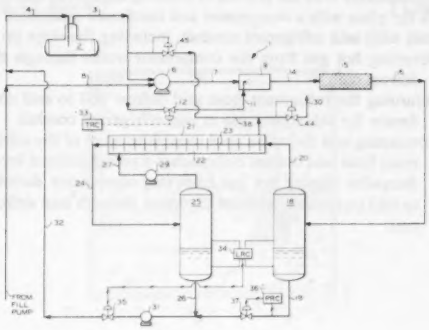
gas from said reservoir for vaporized gas directly into said gas withdrawal line without passing said vaporized gas into said insulated reservoir.

4,110,996

METHOD AND APPARATUS FOR RECOVERING VAPOR

Max W. Thompson, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 2, 1977, Ser. No. 792,736
Int. Cl.² F17C *13/00*
U.S. Cl. 62—54 **17 Claims**



1. A method of recovering vapor expelled from a container during filling with a vaporous liquid, said method comprising the steps of:
(a) conducting expelled vapor to a compressor means;
(b) compressing said expelled vapor;
(c) cooling the thus compressed vapor to a temperature sufficient for condensing a portion of the compressed vapor, forming a first vapor portion and a first liquid portion;
(d) separating the first vapor portion from the first liquid portion;
(e) cooling the thus separated first vapor portion by indirect contact with a coolant for condensing a portion of the first vapor portion to form a second vapor portion and a second liquid portion;
(f) separating the second vapor portion from the second liquid portion; and
(g) expanding the thus separated second vapor portion and using the thus expanded second vapor portion as at least a portion of said coolant.

4,110,997

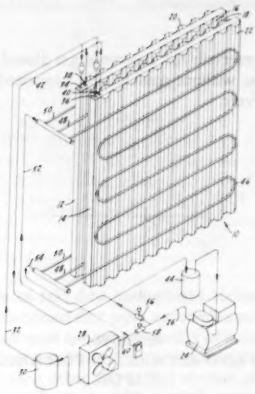
HOT GAS DEFROST SYSTEM

Michael C. Klotz, Chicago, and Viung C. Mei, Mount Prospect, both of Ill., assignors to Dole Refrigeration Company, Lewisburg, Tenn.

Division of Ser. No. 696,886, Jun. 17, 1976, Pat. No. 4,043,144. This application Jun. 6, 1977, Ser. No. 803,521

Int. Cl.[2] F25B *41/00, 47/00;* F25D *11/04*

U.S. Cl. 62—81 **2 Claims**



1. A method of defrosting the heat transfer surfaces in an eutectic refrigeration plate system where a refrigerant conduit is within the plate and a defrost coil is exterior to said plate, simultaneously with the process of freezing the eutetic solution with the plate with a compressor and condenser connected in circuit with said refrigerant conduit, including the steps of:

diverting hot gas from the compressor outlet through the defrost coil,

returning the refrigerant from said defrost coil to said condensor for subsequent use in said refrigerant conduit,

continuing said diversion until the temperature of the refrigerant from said defrost coil reaches a predetermined level, thereafter passing hot gas from said compressor directly to said condenser, without diversion through said defrost coil.

4,110,998

APPARATUS FOR DETECTING AND REMOVING CONTAMINANTS FROM A REFRIGERATION SYSTEM

Charles Owen, 2120 Cannon Way, Marietta, Ga. 30064

Filed May 27, 1977, Ser. No. 801,043

Int. Cl.[2] F25B *45/00*

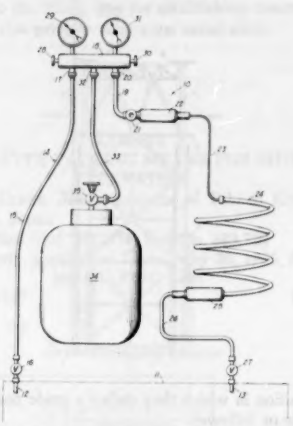
U.S. Cl. 62—125 **8 Claims**

1. A device for adding on to a refrigeration system having a liquid refrigerant line, a suction line, and connecting lines therefore, said device comprising:

a. a conduit means for communicating the refrigerant line to said suction line; means for connecting opposite ends of the conduit means respectfully to the suction line and the liquid refrigerant line;

b. means in said conduit means for removing contaminents from said refrigerant;

c. means for selectively connecting a source of new refrigerant with said conduit means; and



d. means in said conduit means adjacent said suction line for creating a pressure differential for said refrigerant from a liquid to a vapor.

4,110,999

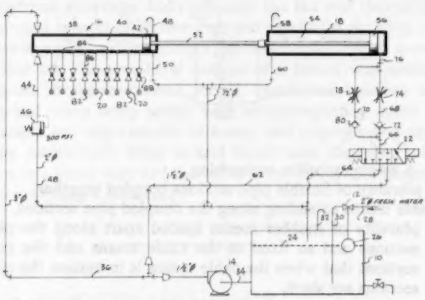
SPRAY COOLING TEMPERATURE CONTROL SYSTEM

Miro Dvirka, 12 Hamilton Pl., Garden City, N.Y. 11530

Filed May 5, 1977, Ser. No. 794,092

Int. Cl.[2] F28D *3/00*

U.S. Cl. 62—171 **9 Claims**



1. An evaporative spray cooling system for cooling an effluent fluid comprising a means for providing a constant pressure supply of coolant fluid, a manifold having an elongated bore therein, a piston movable within said manifold bore, spray nozzles communicating with ports spaced along said manifold bore and opening into said manifold bore, an actuator operatively connected to the manifold piston, said pressurized fluid supply communicating with a first end of said manifold bore to supply coolant fluid to the manifold bore, temperature control means for selectively activating said actuator to permit the force of the supply fluid on the manifold piston to move the manifold piston toward the second end of the manifold bore in response to an increase in effluent fluid temperature above a predetermined temperature thereby opening additional ports to supply coolant fluid to additional spray nozzles to decrease the temperature of the gas, and for selectively activating said actuator to move the manifold piston in the opposite direction as the temperature of the effluent gas decreases below the predetermined temperature to close additional ports and spray nozzles and permit the temperature of the effluent gas to rise thereby providing automatic spray cooling by supplying con-

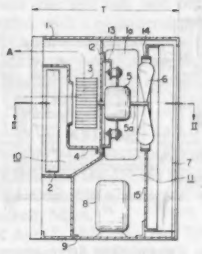
stant pressure coolant to a sufficient number of spray nozzles to achieve the necessary cooling of the effluent fluid.

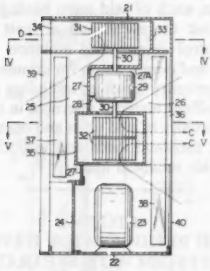
4,111,000

ROOM AIR CONDITIONER

Akio Sakazume; Hiroshi Iwata; Hiroo Nakamura, all of Yokohama; Hiroyuki Ogawa, Tochigi; Susumu Kashiwazaki, Utsunomiya, and Saneaki Nakao, Tochigi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 14, 1977, Ser. No. 759,413
Claims priority, application Japan, Jan. 19, 1976, 51-4008
Int. Cl.² F25D *23/12, 17/06*
U.S. Cl. 62—262 **7 Claims**





1. A room air conditioner comprising:

a cabinet formed in its front facing the inside of a room with a suction opening and an outlet port for indoor air and at its rear facing the outside of the room with a suction opening and an outlet port for outdoor air;

a partition plate dividing the interior of said cabinet into an indoor space and an outdoor space and including at least one surface which is not perpendicular to a bottom of said cabinet;

a first heat exchanger mounted in said indoor space of said cabinet and disposed in spaced juxtaposed relation to said suction opening for indoor air;

a second heat exchanger mounted in said outdoor space of said cabinet and disposed in spaced juxtaposed relation to said suction opening for outdoor air;

a fan motor arranged in said outdoor space of said cabinet and supported by said partition plate in such a manner that its output shaft is disposed perpendicular to the bottom of said cabinet, said output shaft having one end portion penetrating said non-perpendicular surface of said partition plate to extend into said indoor space and the other end portion located within said outdoor space;

a first centrifugal fan of the single suction type supported by said one end portion of said output shaft of said fan motor extending into said indoor space;

a second centrifugal fan of the double suction type supported by said the other end portion of said output shaft of said fan motor located within said outdoor space;

a compressor supported on the bottom of said cabinet in said outdoor space of said cabinet and located in a manner to face an end face of said second centrifugal fan;

a first spiral casing mounted in said indoor space of said cabinet in a manner to enclose an outer peripheral portion of said first centrifugal fan and communicate with said outlet port for indoor air, said first spiral casing being operative to lead indoor air tangentially of said first centrifugal fan to be exhausted through said outlet port in said cabinet into the inside of the room after said indoor air is sucked through said indoor air suction opening, cooled by said first heat exchanger, introduced into said indoor space, sucked by said first centrifugal fan discharged from said first centrifugal fan; and

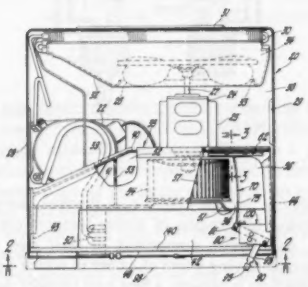
a second spiral casing mounted in said outdoor space of said cabinet in a manner to enclose an outer peripheral portion of said second centrifugal fan and communicate with said outlet port for outdoor air, said second spiral casing being operative to lead outdoor air tangentially of said second centrifugal fan to be exhausted through said outlet port in said cabinet to the outside of the room after said outdoor air is sucked through said outdoor air suction opening and said second heat exchanger to cool said second heat exchanger, introduced into said outdoor space to cool said compressor and said fan motor, sucked by said second centrifugal fan, and discharged from said second centrifugal fan.

4,111,001

ROOM AIR CONDITIONER DOOR OPERATING MECHANISM

John H. Loos, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 31, 1977, Ser. No. 801,862
Int. Cl.² F25D *17/06*
U.S. Cl. 62—427 **3 Claims**



1. In a room air conditioning unit having outer and inner compartments with a partition therebetween and an air flow opening in said partition with a door pivotally mounted adjacent the partition opening for movement between a closed and a fully open position, means in said inner compartment supporting a door control assembly for opening and closing said door so as to control the flow of air through the opening, said door control assembly comprising a bell-crank lever actuator and a pressure plate, said lever actuator including a cross arm portion and a manually operated stem arm normal to said cross arm portion accessible from the room side of said unit, pin means pivotally securing said lever actuator between said pressure plate and said inner compartment support means for pivotal movement of said lever actuator relative thereto, a resilient linear push-pull rod having one end thereof secured adjacent to one free end of said cross arm portion and its opposite end secured by double hook means to said door, indent means on said lever actuator contacting said support means for urging a dimple on said cross arm portion into frictional contact with said pressure plate, said cross arm portion

dimple being in slidable contact with said pressure plate along an arc, whereby said door is releasably retained in a plurality of intermediate open positions by rotation of said stem arm, said pressure plate having a door-closed dimple and a door-open dimple formed therein positioned in spaced relation at either end of said arc, said cross arm portion dimple being selectively cooperable with each of said pressure plate dimples for releasable capture thereby to positively retain said door in either its closed or fully open position, and said push-pull rod having a predetermined length with respect to said door and said door-closed dimple whereby upon said cross arm portion dimple being captured by said door-closed dimple said push-pull rod is resiliently bowed providing a biasing force on said door to retain said door in a substantially air sealed relation with the partition opening.

4,111,002

CYCLIC DESORPTION REFRIGERATOR AND HEAT PUMP, RESPECTIVELY

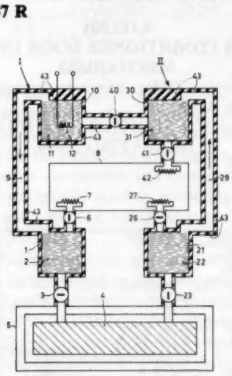
Harmannus Hinderikus Van Mal, and Eric Tapley Ferguson, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,526

Claims priority, application Netherlands, Feb. 25, 1976, 7601906

Int. Cl.[2] F25B *7/00, 19/00*

U.S. Cl. 62—467 R **4 Claims**



1. In a device for the transfer of thermal energy from a region of lower to a region of higher temperature by cyclic desorption, said device comprising at least two thermodynamic units each having a first chamber in which a sorbent for a working medium is present, a first heat transfer device interruptibly communicating the first chamber with a place to be cooled, a second heat transfer device interruptibly communicating the first chamber with a place to be heated, a second chamber communicating with the first chamber via a communication duct, said second chamber comprising a sorbent which, at equal working medium pressure, sorbs working medium at a higher temperature level than the sorbent in the first chamber, the second chamber furthermore comprising a heat source and a third heat transfer device communicating interruptibly the second chamber with a heat absorber for supplying and withdrawing, respectively, working medium to and from, respectively, the first chamber by cyclic heating and cooling the sorbent in the second chamber, the improvement wherein the first chambers of the thermodynamic units comprise the same sorbent but the second chambers of which comprise mutually different sorbents which, at equal working medium pressure, mutually sorb at different temperature levels, the second chambers being mutually arranged in an order of decreasing sorption temperature level, and wherein one of each pair of adjacent second chambers having the higher sorption temperature level, as a heat source for that one having the lower sorption temperature level, communicates interruptibly therewith via the third heat transfer device.

4,111,003

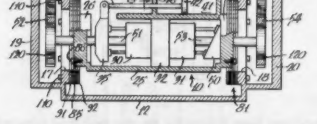
HYDRAULIC TRANSMISSION DRIVE ASSEMBLY WITH NOISE ATTENUATION MEANS

Jimmy W. Bolinger; Frederic W. Pollman, both of Ames, and David N. Polaski, Nevada, all of Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 17, 1977, Ser. No. 797,867

Int. Cl.[2] F15B *15/18;* **F16H** *39/46*

U.S. Cl. 60—469 **15 Claims**



1. A hydrostatic transmission drive assembly with reduced noise transmission including a primary housing, a housing assembly mounting a pair of hydraulic units with an interconnecting port plate, each of said units having a shaft and gear assembly associated therewith and at least one unit having displacement control means, and isolation mounting means operable in shear and compression for connecting said housing assembly to said primary housing, including a multi-layer unit with layers of resilient material operable in compression with respect to forces axially of said units and operable successively in shear for light torsional loads and in both shear and compression for heavier torsional loads.

4,111,004

GAS OPERATED REFRIGERATOR HAVING A SEALED COMBUSTION SYSTEM WITH SEPARATED FRESH AIR AND COMBUSTION GAS CONDUITS

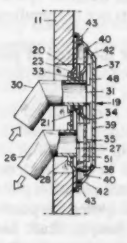
Peter Erik Blomberg, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Oct. 30, 1975, Ser. No. 627,083

Claims priority, application Sweden, Nov. 1, 1974, 7413780

Int. Cl.[2] F25B *15/00*

U.S. Cl. 62—476 **2 Claims**



1. In a gas-operated refrigerator positioned in a room and provided with a gas burner of low capacity, a flue pipe, an atmospheric air conduit for said gas burner, a combustion gas conduit connected to said flue pipe; said burner, flue pipe and said conduits forming a sealed combustion system separated from said room but communicating with the atmospheric air outside of said room, the improvement comprising: a ventilator arrangement including two pipes passing through a wall or ceiling of said room and communicating with the atmosphere,

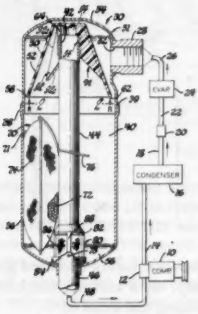
said pipes being connected to said atmospheric air conduit and said combustion gas conduit respectively, the air intake and the combustion gas outlet in said ventilator are so constructed and arranged relative to each other that upon movement of air about them an air flow is induced from said air intake to said gas burner and thereafter to said combustion gas outlet, said ventilator being provided with a spaced disc and a spaced cover, said cover being provided with a peripheral ledge, and the peripheral edges of said disc engaging and resting against said ledge, said disc and the adjacent exterior surface of said wall defining an inner space while said disc and at least part of said cover forms an outer space which is generally parallel to said inner space, said air intake being substantially in the same plane as the exterior surface of said wall and positioned in said inner space, said combustion gas outlet passing through said inner space and said disc and into said outer space, and said cover being provided with a peripheral part having openings communicating the inner and outer spaces to the ambient, and said combustion gas outlet being located approximately 5–12 mm. beyond the exterior surface of said wall.

4,111,005

PRESS-ON PLASTIC BAFFLE FOR ACCUMULATOR-DEHYDRATOR

J. D. Livesay, Tipp City, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1977, Ser. No. 785,333
Int. Cl.[2] F25B *43/00*
U.S. Cl. 62—503 **2 Claims**



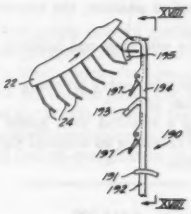
1. A suction accumulator for an automotive air conditioning system including an evaporator comprising, a hollow tubular casing, a suction outlet tube extending vertically within said casing on the principal axis thereof from a point adjacent the casing bottom and terminating in an upper open end located a predetermined distance from the casing top, an inlet connected to the output of the evaporator for injection of high pressure refrigerant fluid into said casing, said inlet located in the casing side wall below said tube upper open end, a plastic baffle member slidably mounted on said tube upper end in substantially concentric relation with said casing, said baffle member including an outer truncated conical baffle and inner central press-fit securing means, said baffle having an open lower end located below said casing inlet and a closed upper end located above said casing inlet, said baffle having an outer wall upwardly decreasing in cross sectional area with its maximum cross sectional area sufficiently less than said casing side wall to provide an annular flow gap therebetween, whereby refrigerant fluid from said inlet impacts against the outer wall of said baffle for gravity flow via said annular gap to the bottom of said casing, said securing means in the form of a plurality of equally spaced, vertically extending, substantially obtuse and triangular-shaped radial webs; each said web having a base portion integrally molded on the inner wall of said baffle and upper and lower leg portions, each of said lower leg portions providing an upwardly tapered lead-in edge so as to align said baffle for slidable reception on said tube upper end, an arcuate sectioned rib coextensive with each upper leg portion, each said rib subtending a predetermined angle, said ribs dimensioned to establish a telescopic press-fit with said tube, each said rib having a notched portion adjacent its upper end defining a stop shoulder operative to engage the tube upper open end, whereby said baffle closed upper end is spaced a predetermined distance above said tube open end to define with said arcuate ribs a plurality of vapor passages therebetween, such that vaporous refrigerant fluid moves upwardly from said casing bottom along said baffle inner wall for entrance into said tube open end via the vapor passages.

4,111,006

APPARATUS FOR PRODUCING PATTERNED DEEP PILE CIRCULAR KNITTED FABRICS

James D. Golladay, Wauwatosa, and Norman C. Abler, Menominee Falls, both of Wis., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 689,066, May 24, 1976, which is a division of Ser. No. 358,398, May 8, 1973, Pat. No. 3,973,414. This application Nov. 4, 1977, Ser. No. 848,646
Int. Cl.[2] D04B *9/14*
U.S. Cl. 66—9 B **3 Claims**



1. In a pile fabric circular knitting apparatus including a rotatable needle cylinder and reciprocatable knitting needles therein, supply means for delivering fibers to a plurality of feeding means providing zones spaced about the circumference of the cylinder wherein the fibers are picked up by certain of said knitting needles as they are selectively reciprocated into the respective zones, and yarn feed means for delivering backing yarn between certain of said zones to be picked up by the knittig needles actuated to receive said yarn, the combination which comprises: means for selectively reciprocating the individual knitting needles into said zones to cause the needles to remove fibers from the zones for transfer to knitted fabric; pattern means controlling said supply means to vary the amount of fibers supplied to the respective zones; controllable means separate from said supply means selectively regulating the cooperative relationship of the needles with the zones to modify the quantity of fibers that said knitting needles will transfer from a respective one of said zones to the knitted fabric; dynamic control means functioning with the apparatus in continuous and uninterrupted operation, for actuating said controllable means, whereby to control the density of pile in the knitted fabric; and means separate from said controllable means and said dynamic control means for reciprocating the needles to pick up yarn from said yarn feed means and integrate the fibers and the yarn into interlocking loops of the knitted fabric, said needles comprising companion relatively slidably operative needle elements one of which elements is adapted to transfer more fiber than the other of said elements, and said controllable means being operative to select said elements for picking up fiber in any of the respective zones.

4,111,007
YARN CHANGING DEVICE IN A FLAT-BED KNITTING MACHINE

Nobuaki Yokoyama, Kodaira, Japan, assignor to Silver Seiko Ltd., Kodaira, Japan

Filed Nov. 16, 1977, Ser. No. 851,972
Claims priority, application Japan, Nov. 26, 1976, 51-141102
Int. Cl.[2] D04B *3/06, 15/48, 27/10, 35/00*
U.S. Cl. 66—125 R 14 Claims

11. In a yarn changing device for a flat-bed knitting machine having a carriage slidable on a needle bed of the machine, the yarn changing device having a housing supported at one end portion of the needle bed, three or more yarn guides mounted in the housing for movement from and to an operative position, and a spring for each yarn guide for urging the associated yarn guide from the operative position, the improvement comprising:

means operable for selecting and holding a predetermined yarn guide;

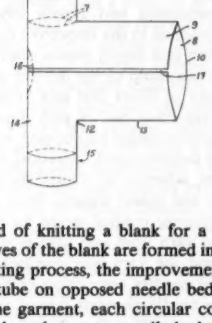
arresting means for releaseably arresting a yarn guide in the operative position; and

means for moving a selected yarn guide to the operative position and for releasing an arrested yarn guide from the operative position.

4,111,008
SWEATER BLANK AND METHOD OF KNITTING SAME

Frank Robinson, and Nigel Stephen Whatmough, both of Breaston, Great Britain, assignors to Courtaulds Limited, London, England

Filed Jul. 27, 1977, Ser. No. 819,472
Claims priority, application United Kingdom, Aug. 10, 1976, 33209/76
Int. Cl.[2] A41B *9/06*
U.S. Cl. 66—176 9 Claims



1. In a method of knitting a blank for a sleeved garment wherein the sleeves of the blank are formed integrally with the blank in the knitting process, the improvement comprising,

(a) knitting a tube on opposed needle beds to constitute a sleeve for the garment, each circular course of the tube being located partly on one needle bed and partly on the other,

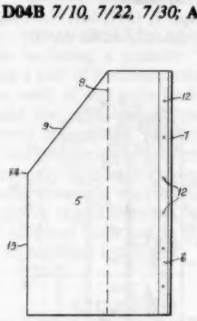
(b) continuing knitting to make two fabrics integral with said sleeve tube, one on one of said needle beds to form the front of the garment and the other on the other needle bed to form the rear of the garment, wherein each of said two fabrics has courses extending in the direction from neck to waist of the garment and has wales which are a direct continuation of wales of said tube and extend in the direction from side to side of the finished garment, and

(c) further continuing knitting to make a further tube to constitute the other sleeve of the garment integral with said two fabrics, wherein each circular course of said further tube is located partly on one needle bed and partly on the other, and has wales which are a direct continuation of wales in said fabrics.

4,111,009
KNITTING METHOD AND ARTICLE FOR A BODY PANEL

Frank Robinson, Breaston; Keith Harry Girt, Menstone, near Ilkley, and Nigel Stephen Whatmough, Breaston, all of England, assignors to Courtaulds Limited, London, England

Filed Aug. 11, 1976, Ser. No. 713,425
Claims priority, application United Kingdom, Aug. 12, 1975, 33520/75
The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.
Int. Cl.[2] D04B *7/10, 7/22, 7/30;* A41D *1/04*
U.S. Cl. 66—189 7 Claims



1. A method of manufacturing a knitted garment to cover at least the upper body, on a knitting machine having needles, said method comprising the steps of

(a) knitting two front panels so that said panels together constitute the front of the garment and so that each panel starts from a non-run set-up along an edge thereof and has wales extending from said edge,

(b) shaping said panels on said knitting machine during knitting by changing the number of neeldes in action, and

(c) incorporating said panels in a garment so that each of said set-ups is located in the front of the garment and extends along an up-and-down line therein, said wales of each panel extending horizontally to an associated side of the garment front.

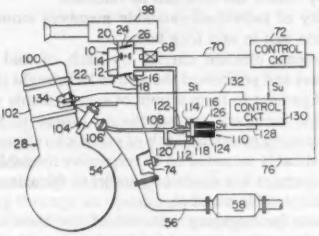
4,111,010
AUTOMOTIVE INTERNAL COMBUSTION ENGINE

Hidehiro Minami, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Mar. 2, 1976, Ser. No. 663,059
Claims priority, application Japan, Mar. 7, 1975, 50-31753[U]; Mar. 24, 1975, 50-35070
Int. Cl.[2] F02B *75/10*
U.S. Cl. 60—276 1 Claim

1. An internal combustion engine comprising a mixture supply system for producing a mixture of air and fuel to be delivered into the engine cylinders, an exhaust system having therein a catalytic converter which is reactive to at least one type of air-contaminative compound in the exhaust gases

passed through the exhaust system and which is capable of producing a maximum conversion efficiency against the exhaust gases resulting from a mixture having a predetermined air-to-fuel ratio, an exhaust sensor for detecting the concentration of at least one chemical component in the exhaust gases passed through the exhaust system and producing an output signal representative of the detected concentration of said chemical component, control means responsive to the output signal of said exhaust sensor for regulating the air-to-fuel ratio of the mixture to be produced in said mixture supply system toward said predetermined air-to-fuel ratio on the basis of said signal, detecting means for detecting engine temperature and producing an output signal representative of the detected engine temperature, a control circuit responsive to the output signal of said detecting means for producing an output signal when the signal from the detecting means is indicative of an engine temperature lower than said predetermined level, an ignition system including a vacuum spark advance mechanism to produce vacuum advance responsive to the vacuum developed in the engine intake manifold through a vacuum passageway, ignition timing retarding means including valve means electrically connected to said control circuit and operable to interrupt the communication between the vacuum advance mechanism and the intake manifold through said vacuum pas-



sageway and provide communication between the vacuum advance mechanism and the open air in response to the output signal delivered from said control circuit whereby said vacuum advance mechanism is disabled from producing the vacuum spark advance in the presence of the output signal from said control circuit, said valve means comprising a valve chamber formed with an air inlet port open to the atmosphere and an air outlet port in communication with said vacuum passageway, a valve element movable in said valve chamber between a first position to close said air inlet and outlet ports and a second position opening the air inlet and outlet ports concurrently for providing communication therebetween, said valve element being in the first and second positions thereof in the absence and presence, respectively, of the output signal from said control circuit, and a plunger with a conical free end movable together with said valve element between a position to provide vacuum communication through said vacuum passageway in response to the movement of said valve element into said first position thereof and a position to block said vacuum communication by the abutment of said conical free end onto a corresponding conical passage portion in said vacuum passageway and provide air communication between the vacuum advance mechanism and the atmosphere through said air inlet and outlet ports in response to the movement of said valve element into said second position thereof.

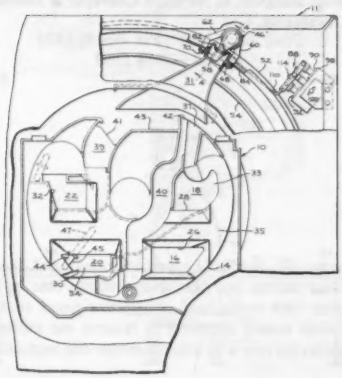
4,111,011
ADDITIVE DISPENSING SYSTEM

Richard A. Waugh, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 1, 1977, Ser. No. 829,687
Int. Cl.[2] D06F *39/02*
U.S. Cl. 68—17 R **5 Claims**

1. In an automatic washer having a basket, an outer tube and an additive dispensing system including a multi-compartmented dispenser, a liquid flow diversion arrangement having a liquid diverter mechanism for selectively diverting liquid into pre-selected dispenser compartments for flushing the additives into the tub at pre-determined times during a cylce of the washer, the improvement comprising:

a. a pivotal body with a liquid inlet opening at one end connected to a water inlet means and a nozzle at the other end with a liquid outlet opening in liquid flow communication with the dispenser, and

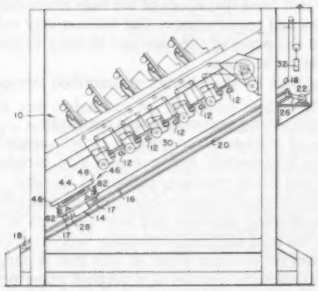


b. a three position nozzle control mechanism including two solenoids with plungers, a lever arm connecting the solenoid plungers, biasing means to center the lever arm when both solenoids are de-energized, and a rod connecting the lever arm and the nozzle whereby the nozzle is pivoted to a different position responsive to separate energization fo each solenoid and de-energization of both solenoids.

4,111,012
DYEING MACHINE

John H. O'Neill, Jr., Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 745,658, Nov. 29, 1976, Pat. No. 4,055,868.
This application Apr. 18, 1977, Ser. No. 788,137
Int. Cl.[2] D06B *1/02, 11/00*
U.S. Cl. 68—205 R **1 Claim**



1. Apparatus to jet dye a textile product comprising: a frame having a pre-determined width, a dye jet gun bar mounted on said frame, said gun bar having a plurality of dye emitting jets along a portion of the length thereof, the width of said frame being substantially greater than the combined length of the dye jets in said gun bar, a textile product carrier, means to move said textile product carrier under said dye jets to lay down a pattern of dye on a textile product carried thereon and means

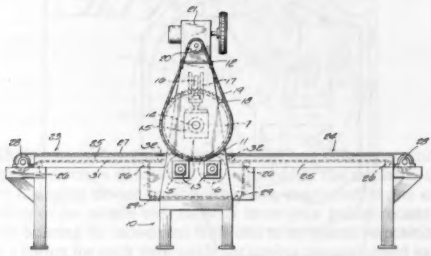
on the carrier to move the textile product in a direction parallel to said gun bar to allow the application of dye on the textile product to produce another pattern of dye on the textile product adjacent the first applied pattern of dye.

4,111,013

METHOD OF AND MACHINE FOR REMOVING OIL FROM ANIMAL HIDES

John E. Zimmerman, and Richard M. Reis, Sr., both of Janesville, Wis., assignors to Northern Conveyor & Manufacturing Corp., Janesville, Wis.

Filed Jul. 5, 1977, Ser. No. 812,521
Int. Cl.[2] C14B *1/08*
U.S. Cl. 69—21 **11 Claims**



1. A method of removing naturally present oil from an animal hide, which method comprises:

with the hide in the condition it is at the conclusion of the curing operation to which hides are conventionally subjected preparatory to further treatment, passing the hide with its hair side down successively between the underside of a large diameter power driven horizontally oriented cylinder having a resiliently deformable but non-absorbent, definitely not bibulous surface, and two small diameter solid surfaced rolls that are parallel to one another and to the cylinder and are located at the underside of the cylinder; and maintaining sufficient pressure between the cylinder and the rolls to cause said resiliently deformable but non-absorbent, definitely not bibulous surface of the cylinder to progressively conform to the curvature of the solid surfaced rolls as said surface comes into pressure-exerting coaction with the rolls, to thereby flex narrow band-like zones of the hide alternately upward and downward and, by such flexure, subject the hair side of the said band-like zones of the hide alternately to compression and tension forces that successively collapse and expand the pores of the hide and thereby express oil that collects in the pores.

5. A machine of the character described comprising the combination of:

A. a frame having upstanding side members;

B. a pair of solid-surfaced parallel closely spaced rolls extending horizontally between said side members of the frame and freely rotatably supported thereby;

C. a cylinder that is considerably larger in diameter than said rolls extending between said side members of the frame above the rolls and freely rotatably supported by said side members for rotation about an axis that is parallel to the axes of the rolls and lies in a vertical plane between the rolls, the cylinder having a surface layer that is resiliently deformable, non-absorbent and definitely not bibulous;

D. pressure means maintaining the cylinder and rolls engaged with sufficient force to deform the engaged portions of the resiliently deformable surface layer of the cylinder and conform the surface thereof to the curvature of the rolls; and

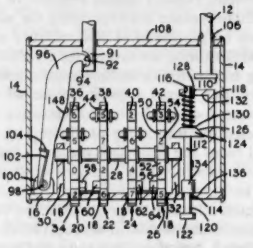
E. means operable to receive and feed sheet material through the machine with said material moving successively between the rolls and the cylinder.

4,111,014

COMBINATION LOCK

Norman Epstein, Rte. 301, Carmel, N.Y. 10512

Filed Jan. 14, 1977, Ser. No. 759,454
Int. Cl.[2] E05B *37/06*
U.S. Cl. 70—25 **10 Claims**



1. A combination lock comprising lock body,

a lock-operating member mounted for movement from a normal position toward a second position which it must occupy before the lock can be released,

a plurality of individual rotatable members mounted on a common axis in said lock body,

a lock-release element carried by each of said rotatable members and positioned thereon to be brought into operative alignment to form a train of said elements when said rotatable members are selectively turned to respective lock-opening positions, each of said lock-release elements being slidably mounted on its respective rotatable member for movement in a direction parallel to the axis of rotation of said rotatable member,

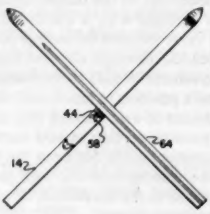
and means for engaging one end of the train of aligned lock-release elements and for transmitting a lock-opening force through said train of operatively-aligned lock-release elements to said lock-operating member, in a direction to move the latter to its second position.

4,111,015

SKI LOCK

Robert A. Look, 8404 W. Mercer Way, Mercer Island, Wash. 98040

Division of Ser. No. 322,906, Jan. 11, 1973, Pat. No. 3,967,476.
This application Nov. 12, 1974, Ser. No. 517,200
Int. Cl.[2] E05B *73/00*
U.S. Cl. 70—58 **5 Claims**



1. A combination of a pair of skiis and

a locking apparatus, said combination comprising:

a. said pair of skiis comprising a first ski and a second ski;

b. said locking apparatus comprising a first bracket integral with said first ski and a second bracket integral with said second ski;

c. said first bracket and said second bracket being capable of fitting together;

d. a locking means for releasably securing together said first bracket and said second bracket;

e. said first ski and said second ski, each having a metal beam plate and wherein said beam plate is an integral part of the ski and reinforces the ski;

f. said first bracket being attached to the beam plate of said first ski by a fastening means; and,

g. said second bracket being attached to the beam plate of said second ski by a fastening means.

4,111,016

LOCKING FASTENER ASSEMBLY

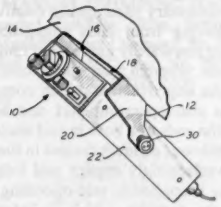
Raymond B. Dawson, Berkeley Heights, N.J., assignor to Super Stud Products, Inc., Berkeley Heights, N.J.

Continuation-in-part of Ser. No. 744,629, Nov. 24, 1976. This application Feb. 11, 1977, Ser. No. 767,760

The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.

Int. Cl.[2] E05B *73/00*

U.S. Cl. 70—58 **8 Claims**



1. A locking fastener assembly for securing electronic equipment or the like to a mounting bracket or the like, comprising in combination:

a stud assembly comprising a threaded shank portion for passing through an opening in said mounting bracket and being threadingly receivable in an opening at said equipment, and an enlarged head portion at one end of said shank portion having a pair of openings for receiving engaging pins therein from a cooperating tool;

an annular collar surrounding said head portion and projecting in a direction opposite said threaded shank to at least cover the rim of said head portion, said collar being freely rotatable about and unlockable with respect to said head portion to prevent grasping of said head portion by a tool or interlocking of said head portion with said collar; and

a tool member having a face opposable to said collar and head portions, said face including a pair of engaging pins arranged in a pattern mirroring said pattern on said head portion, whereby by overlying said pattern on said tool member with said mirroring pattern on said head portion, said pair of pins may engage with corresponding openings in said head to permit application of torque to tighten and loosen said stud assembly.

4,111,017

MANUALLY OPERATED CODED SWITCH

Jon H. Barnette, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 21, 1977, Ser. No. 808,487

Int. Cl.[2] H01H *27/10*

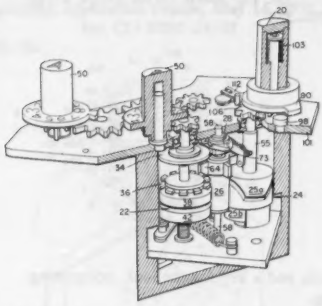
U.S. Cl. 70—293 **8 Claims**

1. A coded mechanism comprising:

a plurality of independently rotatable code wheel assemblies on a like plurality of generally parallel axes; means for rotatably supporting each of said assemblies on said axes, said code wheel assemblies being operably connected to a like plurality of independently rotatable code knobs for rotating said assemblies, each of said assemblies including a location at its periphery whose angular relationship is representative of a code bit;

a control cam comprising a function cam and a function detent operably connected to a function knob, said control cam and said function knob having neutral, try, recode and actuate positions; and

means controllable by said control cam for releasably engaging said code wheel assemblies, said assemblies being



released for rotation at neutral, actuate and recode positions of said control cam, said try, recode and actuate positions being achievable only when said code wheel assemblies are rotated to positions where their angular relationships are representative of a correct code.

4,111,018

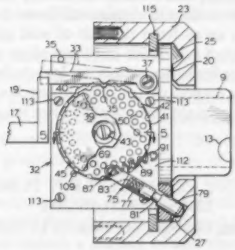
CARD OPERATED LOCK ASSEMBLY

Aksel Pilvet, R.R. #2, Warsaw, Ontario, Canada

Continuation-in-part of Ser. No. 748,482, Dec. 8, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,811

Int. Cl.[2] E05B *21/00*

U.S. Cl. 70—352 **16 Claims**

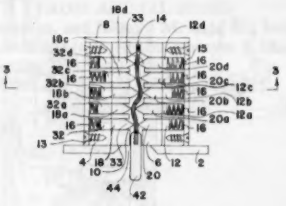


1. A lock and coded key for operating said lock, said lock comprising a housing having a key hole, a rotatable actuating member, a locking mechanism provided with a lockable portion moveable from a locking position to an unlocking position, first locking means, second locking means, a pusher member for pushing said key into contact with said first locking means, and a locking member, said lockable portion being normally held in said locking position by said first locking means, said second locking means normally being in a release position but being arranged so as to lock said lockable portion in said locking position when a key bearing an incorrect code is inserted in said lock, said key being coded to move said first locking means to a release position without disturbing said second locking means, said lockable portion being tensioned to move to said unlocking position when both said first and second locking means are in a release position, said actuating member being adapted to operate said locking member when said lockable portion is in said unlocking position and to return said lockable portion to said locking position.

4,111,019
PICKPROOF LOCK

Jacob Rabinow, Bethesda, Md., assignor to Hall & Myers, Washington, D.C.

Filed Feb. 22, 1977, Ser. No. 770,484
Int. Cl.[2] E05B *19/02, 19/06, 27/06*
U.S. Cl. 70—358 22 Claims

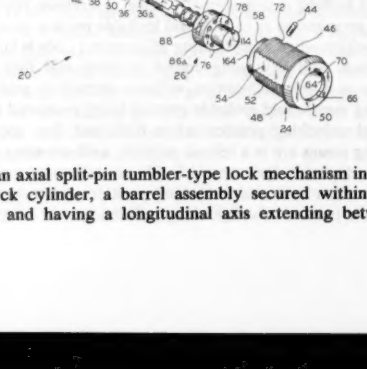


1. A lock, and a key for the lock, comprising:
a casing,
a rotatable cylinder in said casing, said cylinder having an axis,
said cylinder including means which is adapted to receive a complementary key and which will permit the complementary key to rotate said cylinder, and
tumbler means for preventing rotation of said cylinder without a complementary key,
a key for said lock,
said tumber means including a plurality of sets of tumblers, each set of tumblers including two front tumblers at least partially located in said cylinder and at least two rear tumblers, said front tumblers each having a rear end engaging a rear tumbler, the front tumblers of each set approaching different sides of said key,
characterized by:
said key being a strip having two faces, said strip having a thickness of much smaller dimension than its width, said strip having a curvature, in a plane perpendicular to the faces of the strip, that is characterized by a series of bends in opposite directions to displace different tumblers different distances away from the axis of said cylinder so that the rear ends of said front tumblers align with the inner wall of said cylinder to permit the lock to be opened, said key being so shaped that it contains no longitudinal portion that is a straight line for the entire length of the key.

4,111,020
PICK-RESISTANT AXIAL SPLIT-PIN TUMBLER-TYPE LOCK MECHANISM

Frank J. Scherbing, Chicago, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Aug. 15, 1977, Ser. No. 824,443
Int. Cl.[2] E05B *27/08*
U.S. Cl. 70—363 18 Claims

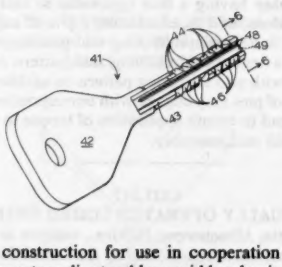


1. In an axial split-pin tumbler-type lock mechanism including a lock cylinder, a barrel assembly secured within said cylinder and having a longitudinal axis extending between front and rear ends thereof, said barrel assembly including a forwardly disposed operating part rotatable about said axis and a rearwardly disposed stationary part adjoining the operating part at a transverse interfacial plane, means forming longitudinal bores in said operating and stationary parts respectively, said bores in respective parts being movable into and out of alignment upon rotation of said operating part, tumblers each having a forwardly disposed driver element carried in one of said operating part bores and a separate rearwardly disposed follower element carried in one of said stationary part bores and the elements adjoining each other when in a pair of aligned bores, said tumblers each being reciprocally movable in the axial direction in a pair of aligned bores between positions wherein the joint between said elements thereof is disposed on opposite sides of said interfacial plane, said operating part being freed for rotation when said joints coincide with said interfacial plane, and spring means yieldingly urging said tumblers in aligned bores forwardly to positions wherein said interfacial plane is bridged by said follower elements to secure the operating and stationary parts against relative rotation, said driver elements having front ends engageable with a key which when moved rearwardly moves said tumblers in aligned bores into positions wherein said joints coincide with said interfacial plane, the improvement which comprises:
ledge means on said operating part and adjacent to and intermediate the ends of a bore in said stationary part, and
rib means on a follower element carried in the latter bore and adapted to overlappingly engage said ledge means when picking torque is applied to said operating part and while the joint of the tumbler which includes said follower element is displaced from said interfacial plane, for preventing longitudinal movement of the last-named follower element in the direction of said interfacial plane.

4,111,021
KEY CONSTRUCTION

Marvin E. Roberts, 2305 S. Arlington, Reno, Nev. 89509, assignor to Marvin E. Roberts, Reno, Nev.; James E. Ward, Atherton, Calif.; Reid A. Roberts, Reno, Nev. and Charlene R. Kinkor, Nevada City, Calif.

Continuation of Ser. No. 505,367, Sep. 12, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 671,010
Int. Cl.[2] E05B *19/06*
U.S. Cl. 70—406 2 Claims



1. A key construction for use in cooperation with a lock incorporating rotary disc tumblers, said key having a generally circular cylindrical shank, said shank being formed with a vee-shaped groove into said shank longitudinally along said shank parallel to the axis thereof, said groove having a depth radially into said shank less than the radius of the arcuate portion of said shank, the area of any unbitted cross section taken transversely of said shank being less than the area of a circle whose radius is equal to the least radius of any arc of said unbitted cross section, said key being bitted with a plurality of chordal planes formed into said shank to the same radial depth one to the other and spaced longitudinally along said shank, each of said chordal planes cooperating with an associated one of said tumblers in said lock, said chordal planes being offset from but parallel to the axis of key rotation, said planes being formable one to the other at a plurality of angles transversely

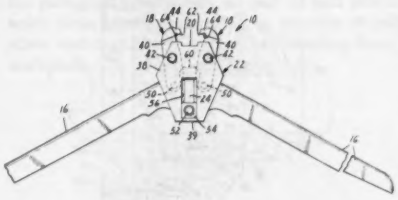
of said shank, the area of each cross section of said key taken transversely through any of said planes being identical one to the other, each of said planes serving as paired bittings for cooperation with said associated tumbler in said lock, each of said paired bittings rotating said associated tumbler to a coded gate opening position by selective rotation of said key in said lock.

4,111,022

MANUAL CRIMPING TOOL

William A. Kruschel, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 2, 1977, Ser. No. 793,084
Int. Cl.[2] B21D 7/06
U.S. Cl. 72—410 4 Claims



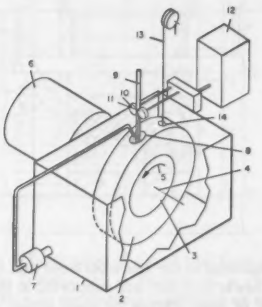
1. A manually operated tool adapted to crimp a clasp around overlapped lengths of non-metallic strap, said tool comprising a frame; a pair of die members each including a body portion and a projecting ledge at one end of said body portion, said ledge and body portion being disposed to provide a generally L-shaped die member; means mounting said die members on said frame with said ledges in opposed relationship for pivotal movement between an open position with said ledges spaced apart to afford positioning said body portions on opposite sides of an uncrimped clasp around overlapping lengths of strap, and a closed position with the ledges closely adjacent; a pair of handles; means mounting said handles for pivotable movement relative to each other between first, second and third positions; means for pivotably coupling said handles to said die members to move said die members from their open position to their closed position upon movement of said handles from their first position to their second position and for maintaining said die members in their closed position upon movement of said handles between their second and third positions; a plunger; and means coupling said plunger to said handles to move said plunger between said opposed die members through positions spaced more than a predetermined distance from the ledges of said die members to afford positioning an open clasp therebetween when said levers are moved between their first and second positions and to move said plunger to an engaged position spaced less than said predetermined distance from said ledges as said handles are moved from their second position toward their third position, the surfaces of said ledges opposite said plunger providing die surfaces comprising planar central portions adapted to engage and bend a top portion of a said clasp over overlapped lengths of straps extending through the clasp and having recessed arcuate outer cam surfaces adapted to roll a locking lip of the clasp over its top portion as said plunger presses the clasp toward said ledges during movement of said plunger to its engaged position.

4,111,023

METHOD FOR CONTINUOUS EXTRUSION

Marc Moreau, Asnieres, France, assignor to Trefimetaux, Paris, France

Division of Ser. No. 676,908, Apr. 14, 1976, Pat. No. 4,041,745. This application Nov. 10, 1976, Ser. No. 740,489
Claims priority, application France, May 14, 1975, 75 15733
Int. Cl.[2] B21C 23/32
U.S. Cl. 72—60 2 Claims



1. A method of extruding a first elongated object capable of plastic deformation and of undefined length into a second object also of indefinite length of the same type but of smaller section, comprising the steps of:

(a) forming two plane, substantially parallel surfaces on said first object the distances between the surfaces being kept constant along the length of the object,

(b) feeding said first object into a grooved passage which is deeper than it is wide formed between a rotor located coaxially with a stator, said stator carrying a die port therein and a stop adjacent said die port,

(c) feeding a viscous fluid into said passage concurrently with said first object so that it at all times surrounds said first object,

(d) the rotation of said rotor forming a fluid stream between the surfaces on the first object and the passage walls so as to fill the gap therein, said rotor movement developing tangential forces in the fluid stream which are transmitted to all surfaces of the object and create pressure which increases gradually in the direction of the die port, and stops where it is at its maximum, thereby forcing said object toward said die port and stop, and

(e) extruding said first object through said die port to obtain said second object, a portion of said viscous fluid passing through said die port.

4,111,024

PRESSING TOOL STRUCTURE FOR SHEET METAL FORMING

Goran Dahlman, Sundsvall, and Jan-Erik Carlsson, Helsingborg, both of Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

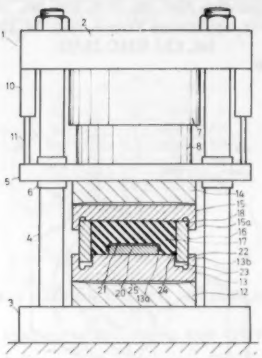
Filed Mar. 28, 1977, Ser. No. 782,161
Claims priority, application Sweden, Apr. 8, 1976, 7604117
Int. Cl.[2] B21D 22/10
U.S. Cl. 72—60 8 Claims

1. In a pressing tool for forming work pieces around forming tools, the pressing tool including an upper tool part, a lower tool part and an elastomeric forming pad in the space between the upper tool part and the lower tool part, at least one of the upper tool part and the lower tool part being movable toward the other tool part, the improvement wherein:

the upper tool part comprises an upper plate with flanges at the peripheral edges thereof directed downwardly;

the lower tool part comprises a lower plate with flanges at the peripheral edges thereof directed upwardly; and

a number of separate wall elements positioned between the upper tool part and the lower tool part, said wall elements



being positioned in the space between said upper tool part and said lower tool part and supported at the ends thereof inwardly of said flanges on said upper plate and the flanges of said lower plate when the upper and lower tool parts approach each other during a pressing operation.

4,111,025

STRAIGHTENING MILL FOR SECTION STEEL

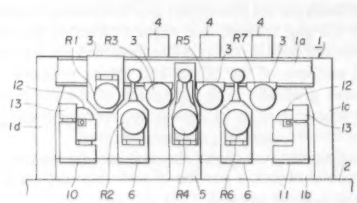
Koe Nakajima, and Hiromi Matumoto, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 718,585, Aug. 30, 1976, abandoned, which is a continuation of Ser. No. 589,397, Jun. 23, 1975, abandoned, which is a continuation of Ser. No. 455,894, Mar. 28, 1974, abandoned. This application Oct. 12, 1977, Ser. No. 841,485

Claims priority, application Japan, Apr. 4, 1973, 48/38358

Int. Cl.[2] B21D *1/02*

U.S. Cl. 72—164 **2 Claims**



1. In a roller straightening mill for effecting straightening of section steel passed therethrough, said section steel having a leading end and a trailing end and being passed through said mill with said leading end first, said mill operating to prevent end crook from occurring in said trailing end of said section steel during said straightening, said mill including a plurality of driving rollers each rotatable about an axis and a plurality of driven rollers each rotatable about an axis, with said axes of said driving and driven rollers being parallel to each other, said plurality of driving rollers being spaced from said plurality of driven rollers to define therebetween a pass line through which said section steel may be passed between said rollers in a predetermined direction, each of said plurality of driving rollers being located on one side of said pass line and each of said plurality of the driven rollers being located on the opposite side thereof, with the axes of said driving rollers being arranged in staggered relationship relative to the axes of said driven rollers, said plurality of driving rollers including a first driving roller located relative to said pass line to be engaged first by the leading end of section steel through said pass line in said predetermined direction, each of said driving rollers other than said first driving roller being mounted in a fixed position with regard to vertical movement of the axes thereof relative to said pass line, the improvement comprising adjustment means for adjustably moving said first driving roller in directions extending generally perpendicular to said pass line and for positioning said first driving roller relative to said pass line prior to passage of said section steel through said roller mill, said adjustment means being adapted to effect said moving and positioning to a degree in accordance with the amount of end crook to be removed from said trailing end of said section steel.

4,111,026

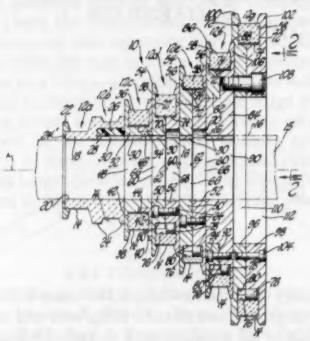
STEPPED CONE DRAW BLOCK

Wilson Ford, Wheatridge, and John Temple Gagnon, Arvada, both of Colo., assignors to Coors Porcelain Company, Golden, Colo.

Filed Oct. 6, 1977, Ser. No. 839,873

Int. Cl.[2] B21C *1/14*

U.S. Cl. 72—289 **10 Claims**



1. A stepped cone draw block for use in drawing wire, the draw block comprising: at least two sheaves each of which includes a pair of round plate-like sheave members having central aligned openings for receiving a shaft on which the sheave is to be mounted for rotation about a central axis of the shaft; said members of each sheave having axial side surfaces that face away from each other along the axis of shaft rotation and also having engaged axially facing surfaces located midway between the side surfaces; annular peripheral flanges on the sheave members spaced axially from each other; each sheave having a ceramic draw ring clamped between the peripheral flanges on the members thereof and the ring having an outer surface for receiving a wire during a wire drawing operation; and means for detachably securing the members of each of said sheaves to each other independently of the members of each other of said sheaves so as to provide clamping of the associated ceramic ring while allowing unclamping and replacement thereof without unclamping the ceramic ring of any other of said sheaves.

4,111,027

ELECTROMAGNETIC APPARATUS

Alan Stuart Bottomley, 69 Queen St., Sandy Bay, Tasmania, 7005, Australia

Filed Feb. 11, 1976, Ser. No. 657,243

Claims priority, application Australia, Feb. 12, 1975, PC0564; Oct. 20, 1975, PC3629

Int. Cl.[2] B21D *11/04*

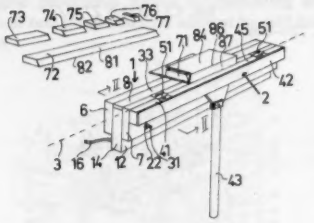
U.S. Cl. 72—320 **18 Claims**

1. A tool for bending workpieces comprising in combination:

an electromagnetic coil;

a pole adapted to be magnetized by the coil and functional in part as a supporting surface for the workpiece;

a ferromagnetic keeper having an edge or surface against which a workpiece may be formed, and adapted to be maintained in a working position, in direct opposition to bending or forming forces, entirely by magnetic force arising from a magnetic flux produced on energization of said coil,



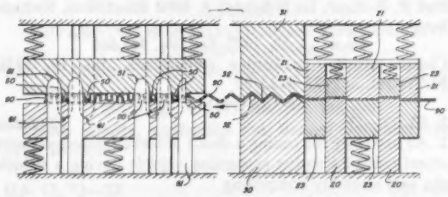
and a work surface means pivotable with respect to the pole to place the plane of said work surface means at least substantially in the same plane as the supporting surface of the pole with substantially no part of said pole or said work surface means projecting on one side of said same plane, and operative in use to apply bending force to the workpiece.

4,111,028

METHOD AND APPARATUS FOR FABRICATING RETICULAR SHEET MATERIAL

Frederick E. Kupsky, 1300 E. Algonquin, Apt. 2G, Schaumburg, Ill. 60195

Filed Aug. 4, 1977, Ser. No. 821,630
Int. Cl.² B21D *31/02*
U.S. Cl. 72—324 **11 Claims**



1. Apparatus for forming a reticulated grid structure comprising:

means for shearing into a workpiece a plurality of slits coaxially disposed in a plurality of parallel rows to form a plurality of interconnected strands;

means for bending said workpiece along the axis of each row of slits to form a ridged structure of corrugations having peaks and valleys at high and low points of said bent interconnected strands said corrugations being coaxial with the slits, having said slits disposed at the peaks and valleys thereof; and

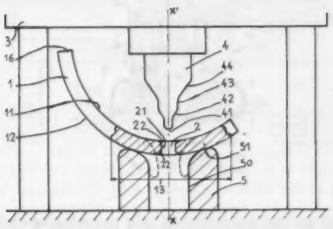
means for insertion into said slits for displacing the portions of said strands adjacent to said slits to form openings therebetween.

4,111,029

MANUFACTURE OF PIPE STUBS IN WALLS OF VERY GREAT THICKNESS

Pierre Dulaquais, Montcenis, France, assignor to Creusot-Loire, Paris, France

Filed Jun. 21, 1976, Ser. No. 698,206
Claims priority, application France, Jan. 9, 1976, 76 00471
Int. Cl.² B21D *51/38*
U.S. Cl. 72—342 **7 Claims**



1. A process of fabrication of a pipe stub from a wall of very great thickness constituting a portion of a chamber under pressure, said process comprising machining an aperture in the wall along an axis corresponding to the axis of the pipe stub to be obtained, the aperture having a diameter of the order of the thickness of the wall and being formed with rounded edges at the internal and external surfaces of the wall, placing the wall on a tubular anvil provided with a central conduit coaxial with the aperture and whose diameter corresponds substantially to the exterior diameter of the pipe stub to be obtained, the anvil being formed with an upper rounded surface whose diameter progressively increases up to a rounded bearing face whose shape corresponds to that of the wall at the juncture with said pipe stub, heating the wall at least in the region surrounding the aperture to a temperature greater than the transformation point A1 but less than the forging temperature, and deforming the wall by introducing a punch with force into the aperture, the punch having a first centering tip of diameter slightly less that of the aperture followed by a conical surface merging with said tip and widening in a direction away from the point and which is rounded in convex form and connects successively to a cylindrical portion whose diameter is substantially equal to the interior diameter of the pipe stub to be obtained, the introduction of the punch first centering the tip in the aperture and then progressively deforming the wall to form the pipe by progressive enlargement of the aperture by progressive penetration of the conical surface of the punch with concurrent diminution of the thickness of the sheet to form a deformed portion coming to be applied against the rounded surface of the anvil.

4,111,030

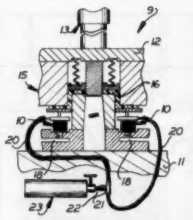
PRESS CUSHION

Lynn R. Shepard, Berea, and John B. Terrell, Solon, both of Ohio, assignors to Teledyne Industries, Inc., Cleveland, Ohio

Filed Apr. 15, 1977, Ser. No. 787,990
Int. Cl.² B21D *22/22*
U.S. Cl. 72—351 **5 Claims**

1. A cylinder assembly to cushion the movement of a workpiece in a die in a press utilized in an environment which is contaminated by particles which are detrimental to the operation of the cylinder assembly, said cylinder assembly comprising a remote source of air at atmospheric pressure which is substantially free of contaminating particles which are detrimental to the operation of said cylinder assembly, a cylinder having opposite end portions, a piston disposed within said cylinder, said piston having a rod attached thereto and extending from a first one of said end portions of said cylinder, first sealing means between said cylinder and said piston, second sealing means between said first end portion of said cylinder

and said rod, first and second variable volume chambers disposed between said end portions of said cylinder and said piston, means for connecting said first chamber with a source of fluid at a relatively high pressure, and means for connecting said second chamber with said source of air which is at atmospheric pressure and is substantially free of particles which are



detrimental to the operation of said cylinder assembly, said means for connecting said second chamber with said source of air at atmospheric pressure including a port in said cylinder and flexible conduit means for connecting said port with said remote source of uncontaminated atmospheric air, said remote source of uncontaminated atmospheric air being spaced apart from said cylinder.

4,111,031

POWDER METAL CROWN GEAR FORMING PROCESS

Alfred C. Vennemeyer, Vandalia, and Richard A. Ernst, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 9, 1977, Ser. No. 831,938

Int. Cl.² B21D *22/00*

U.S. Cl. 72—359 **5 Claims**

1. A method of forming a spur gear having gear teeth with axially crowned working faces from a sintered powder metal compact comprising a cylindrical gear body and gear teeth extending radially from said body, said method comprising applying radially compressing force to the compact gear teeth tips without restricting the compact gear teeth working faces from deformation by pressing the compact into a die having a smooth circular cavity said compressing force thereby reducing the outer diameter of the gear, and

applying an axial compaction force to said compact while constrained in said die such that the axial width of the compact is reduced and said axially crowned gear teeth faces are formed.

4,111,032

PROCESS FOR PRODUCING A METAL SHEET TO BE DEEP DRAWN OR EXTRA-DEEP DRAWN FOR THE FABRICATION OF SHAPED METAL PARTS

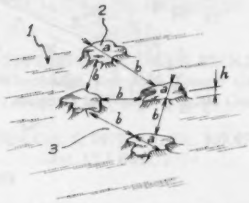
Daniel Raymond Rault, Metz-Vallieres, France, assignor to Societe Lorraine de Laminage Continu, France

Division of Ser. No. 628,600, Nov. 4, 1975, Pat. No. 4,071,657. This application Jul. 11, 1977, Ser. No. 814,377

Claims priority, application France, Nov. 6, 1974, 74 36872; Oct. 9, 1975, 75 30984

Int. Cl.² B21B *27/02*

U.S. Cl. 72—366 **4 Claims**



1. A process for the production of a metal sheet which is intended to be subjected to a drawing operation for the fabrication of a shaped metal part, said sheet comprising on its surface a roughness in the form of plateau portions in relief defining between them recessed valley portions, the average ratio of the dimension of the valley portions to the dimension of the plateau portions in any direction on the surface of the sheet being from 1:1 to 3:1, the average dimension of the plateau portions being from 40 to 200 micrometers and the height of the plateau portions being more than 6 micrometers; said process comprising subjecting a metal sheet to pressure from at least one cold roller, the surface of which has been treated to provide the surface of the roller with a roughness in the form of plateau portions in relief defining between them recessed valley portions, the average ratio of the dimension of the plateau portions to the dimension of the valley portions in any direction being from 1:1 to 3:1, the average dimension of the valley portions being from 40 to 200 micrometers and the height of the plateau portions being greater than 7 micrometers.

4,111,033

ASSEMBLY FOR TESTING SHOCK ABSORBERS INCORPORATED IN VE CLES

Alfred R. Bolliger, Im Sidefadeli 4, 8803 Rüschlikon, Switzerland

Filed Jul. 18, 1977, Ser. No. 816,665

Claims priority, application Switzerland, Jul. 19, 1976, 9191/76; Jul. 3, 1977, 8123/77

Int. Cl.² G01M *17/04*

U.S. Cl. 73—11 **12 Claims**

1. An assembly for testing a shock absorber associated with a wheel pair of a spring suspended vehicle having a vehicle body, said assembly comprising

a. a lifting device for producing a drop motion of at least one wheel so that the vehicle body will rise in oscillation under the influence of springs but damped by a shock absorber after dropping motion thereof, and

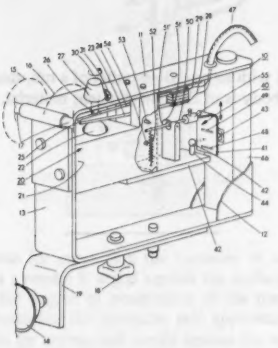
b. means for indicating the condition of a shock absorber of said wheel by simultaneously evaluating the acceleration inherent in the rise of the vehicle body during the first oscillation of the vehicle body and by evaluating the vibrations of the vehicle body after dropping motion thereof, so that both knocking and vibration behavior of said shock absorber are determined by a single drop of said wheel; said indicating means comprising

i. means for sensing the acceleration of the vehicle body during the rise thereof, said means including an inertia body member which is freely mounted for vertical movement in a vertical path,

ii. mounting means for mounting said sensing means to a body component of the vehicle body in the vicinity of a shock absorber to test it, said means including a sensing means housing,

iii. means extending into the vertical path of movement of the inertia body member for generating a signal upon movement of the body member in the vertical path more than a predetermined amount.

iv. an indicating device responsive to the signal generated by said signal generating means for indicating movement more than said predetermined amount by said body member, and



v. light beam oscillating sensing means comprising a light emitter element, a light receiver element, and a shielding element located in the path of the beam between said light emitter element and light receiver element, at least one and not more than two of the emitter, the receiver and the shielding elements being rigidly mounted to said housing, the light receiver being electrically connected to the indicating device whereby during oscillation of the sensing means housing with the vehicle body the light receiver element intermittently receives light from the light emitter element and provides a resultant signal to the indicating device.

4,111,034

APPARATUS FOR MONITORING THE SOLVENT CONTENT OF AIR

Rolf H. Hübner, Pfarrer-Kneipp-Str. 9, Dortmund, Germany (4600)

Filed Apr. 7, 1977, Ser. No. 785,690

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1976, 2615188

Int. Cl.[2] G01N *27/04*

U.S. Cl. 73—23 **11 Claims**

1. An apparatus for monitoring of the solvent content of air in association with a dry cleaning plant, said apparatus comprising:

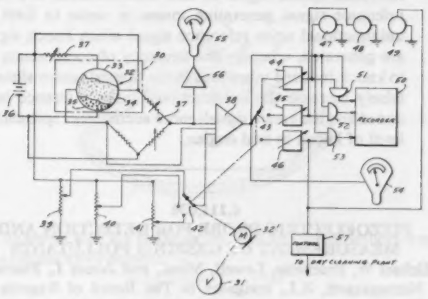
at least one metal oxide semiconductor responsive to the concentration of solvent in air to be monitored and disposed in a measuring chamber adapted to successively receive solvent-containing air from a plurality of sources;

circuit means connected to said semiconductor for indicating the concentration detected by said semiconductor;

means for electrically heating said semiconductor to a predetermined temperature;

a respective setpoint value generator assigned to each of said sources;

a comparator means for sequentially and periodically connecting each of setpoint value generators to said comparator in accordance with the source supplying air to said chamber, said comparator having an output; and



respective indicators sequentially supplied with said output by said commutator means.

4,111,035

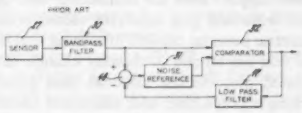
ENGINE KNOCK SIGNAL GENERATING APPARATUS WITH NOISE CHANNEL INHIBITING FEEDBACK

Gene A. West, Kokomo, and Glen C. Hamren, Greentown, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1977, Ser. No. 848,865

Int. Cl.[2] G01N *33/22*; G01L *23/22*

U.S. Cl. 73—35 **2 Claims**



1. Apparatus for use with an internal combustion engine having ringing knock-induced vibrations at a characteristic frequency and other vibrations, the apparatus being effective to generate knock signals representing the knock level therein and comprising, in combination:

a vibration sensor mounted on said engine and responsive to both said ringing knock-induced vibrations and said other vibrations to generate a signal;

a bandpass filter having maximum transmission at said characteristic frequency and responsive to the signal from said sensor during a knock-induced ringing vibration to generate a filtered sensor signal having attenuated components at frequencies other than the characteristic frequency compared with those at the characteristic frequency;

average detector means responsive to said bandpass filter for generating from the filtered sensor signal a unidirectional noise reference signal generally proportional to the average unidirectional amplitude of the filtered sensor signal at a higher amplitude than all but the peaks of those components due to knock-induced engine vibrations;

a comparator effective to compare the filtered sensor signal to the unidirectional noise reference signal and to generate knock signals when the filtered sensor output signal exceeds the unidirectional DC noise reference;

low-pass filter means responsive to said knock signals to

generate a unidirectional noise reference inhibit signal therefrom;

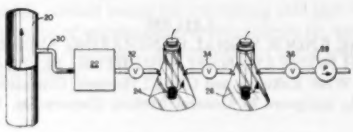
feedback means connected to apply said unidirectional noise reference inhibit signal to said unidirectional DC noise reference signal generating means in sense to limit the unidirectional noise reference signal when knock signals are generated, whereby the tendency of components due to knock-induced vibrations in the filtered sensor signal to falsely increase the unidirectional noise reference is reduced and the knock signals more accurately represent the level of knock in said engine.

4,111,036

PIEZOELECTRIC PROBE FOR DETECTION AND MEASUREMENT OF GASEOUS POLLUTANTS

Michael W. Frechette, Lowell, Mass., and James L. Fasching, Narragansett, R.I., assignors to The Board of Regents for Education of the State of Rhode Island, Providence, R.I.

Filed Jul. 29, 1974, Ser. No. 492,737
Int. Cl.² G01N *31/06*
U.S. Cl. 73—23 **9 Claims**



1. An apparatus for the static detection and measurement of a sulfur dioxide component of a mixed gas stream flowing in a conduit comprising in combination:

a. for each fluid component to be measured, a single vibrateable piezoelectric material mounted on a readily-transportable support base for contacting said piezoelectric material with said gas; substrate means coated on said piezoelectric material capable of sorbing said fluid component of said gas stream to thereby change the weight of said coated piezoelectric material, said substrate means comprising a polyamine; and, electronic oscillator means operatively connected to said coated piezoelectric material for oscillating said material;

b. means for withdrawing a portion of said gas stream from said conduit and for bringing said portion into a test chamber;

c. valve means for sealing said test chamber so as to bring said withdrawn portion of the gas stream into contact with said coated piezoelectric material under substantially static conditions; and,

d. means for determining when the change in vibrational frequency of said coated piezoelectric material is substantially complete, said determining means comprising counter-timer means operatively connected to said coated piezoelectric material, and a digital converter and a recorder operatively connected to said counter-timer means.

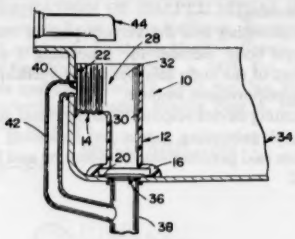
4,111,037

BATHTUB DRAIN AND OVERFLOW TESTING APPARATUS

John T. Fisher, 421 Diamond St., San Francisco, Calif. 94114

Filed Jan. 24, 1977, Ser. No. 761,642
Int. Cl.² G01M *3/02*
U.S. Cl. 73—40.5 R **7 Claims**

1. A portable testing apparatus comprising a body defining passage means therethrough, the passage means having an inlet port and an outlet port, the body being positionable so that the outlet port of the passage means communicates with a drain outlet of a tub, with the inlet port of the passage means being positionable to receive water from a tap of a tub, and also to



communicate with an overflow outlet of a tub, simultaneously, wherein the body is of flexible, resilient material.

4,111,038

METHOD AND APPARATUS FOR DETERMINING THE CENTER OF GRAVITY OF A GOLF BALL

Robert E. Olson, and James R. Braun, both of San Antonio, Tex., assignors to Ray Cook Golf Putters, Inc., San Antonio, Tex.

Filed Oct. 5, 1976, Ser. No. 729,728
Int. Cl.² G01M *1/14*
U.S. Cl. 73—65 **9 Claims**

1. A method of determining the axis of an unbalanced golf ball which axis includes its geometric center and its center of gravity comprising the steps of:

placing a golf ball in a solution consisting of a predetermined quantity of a liquid, a densifying agent and a wetting agent, the proportions of said liquid and said densifying agent being such that said solution will float said golf ball with only a minor portion of the ball being exposed above the surface of said solution, said wetting agent decreasing the surface tension of said solution to allow free rotation of said golf ball;

rotating said ball in said solution;

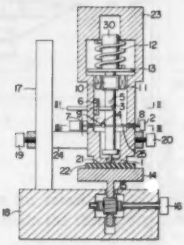
allowing said ball to come to rest in said solution, determining the uppermost point on said ball;

subsequently rotating said ball to determine if the previously determined uppermost point returns to the top following the subsequent rotation.

4,111,039
APPARATUS FOR MEASURING THE HARDNESS OF RUBBER

Takeshi Yamawaki, Hiratsuka; Tokitaro Hoshijima, Yokohama, and Kiichiro Aga, Machida, all of Japan, assignors to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Dec. 16, 1976, Ser. No. 751,478
Claims priority, application Japan, Dec. 19, 1975, 50-151391
Int. Cl.[2] G01N *3/42, 3/48*
U.S. Cl. 73—81 1 Claim



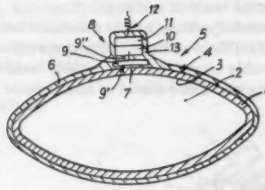
1. Apparatus for measuring the hardness of rubber of the type wherein a needle is urged against the surface of a rubber sample and the degree of penetration of the needle is determined for measuring the hardness, said apparatus comprising driving means for urging said needle against the surface of said sample under a substantially constant speed and force, said driving means including spring means for driving said needle, a lever for causing said needle to store energy in said spring means, releasable latch means for latching said needle in a position in which the spring means is storing energy and for releasing said needle to cause said spring means to urge the needle against the surface of said sample, an electric transducer for detecting the degree of penetration of said needle into said sample thereby producing an electric signal corresponding to the displacement of said needle, an electric circuit for processing said electric signal, switch means which generates a signal when said needle is released, said signal being applied to said electric circuit for determining the starting point of the time necessary to measure said displacement, said electric circuit comprising a rectifier for rectifying the electric signal generated by said electric transducer, a peak value detector for detecting the peak value of the output of said rectifier, an analogue-digital converter for converting the output of said rectifier into a digital quantity, a pulse generator responsive to the signal generated by said switch means for producing a pulse signal which is applied to said analogue-digital converter, and digital display means connected to display said digital quantity.

4,111,040
TESTING FOR CORROSION OF THE INTERNAL WALL OF A METAL CHAMBER

Jaime Gratacos, Morlaas; Christian Perrolet, Pau, and Roger Mousteou, Billere, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Jul. 26, 1977, Ser. No. 819,045
Claims priority, application France, Jul. 30, 1976, 76 23398
Int. Cl.[2] G01B *19/32*
U.S. Cl. 73—105 10 Claims

2. A system for detecting corrosion of the internal surface of a wall of a metal chamber containing a corrosion fluid comprising, a plurality of individual, sealed, rigid enclosures at spaced apart locations on the outside of said chamber wall, means in each of said chambers for detecting a physical quantity indication of the condition of the internal surface of the chamber wall, means connected to said detecting means for measuring and calculating the quantity, means connected to said measuring means for transmitting the measurement to a remote location, and means covering said enclosures and the exterior of

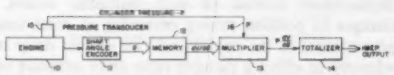


said chamber wall for isolating the wall and the chambers from the external environment.

4,111,041
INDICATED MEAN-EFFECTIVE PRESSURE INSTRUMENT

William J. Rice, Elyria, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 29, 1977, Ser. No. 837,796
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—115 12 Claims



1. Apparatus for measuring the indicated mean effective pressure IMEP of an engine of the type having at least one varying volume chamber and a crankshaft comprising:

shaft angle encoder means for generating a signal for each angle θ of crankshaft rotation;

memory means for storing a $dV/d\theta$ value for each specific θ and for providing an output $dV/d\theta$ for each θ measured by said shaft angle encoder means where V is the chamber volume;

transducer means for providing a signal representative of instantaneous pressure in said chamber;

multiplier means for multiplying the chamber pressure P by $dV/d\theta$ for each θ measured by said shaft angle encoder means; and

means for adding the products out of said mutltiplier means for each θ taking all increments of θ over one complete cycle of engine operation to yield IMEP.

4,111,042
COMBINED PRESSURE AND TEMPERATURE CORRECTION APPARATUS FOR GAS METERS

Lorton W. Bryant, Greenwood, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

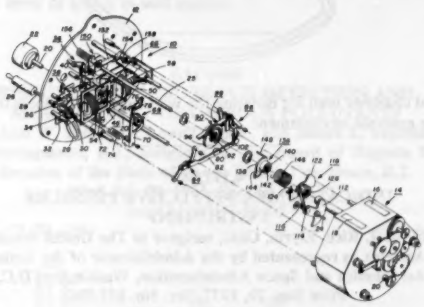
Continuation-in-part of Ser. No. 584,318, Jun. 6, 1975, abandoned. This application Sep. 22, 1977, Ser. No. 835,568
Int. Cl.[2] G01F *3/02, 15/02*
U.S. Cl. 73—194 M 20 Claims

11. Correction apparatus for a fluid meter comprising in combination:

(a) sensing means sensitive to one of fluid pressure or temperature conditions and adapted to be exposed to the metered fluid to produce a linear displacement motion correlated to a sensed condition change thereof in the fluid relative to a standard condition therefor;

(b) input means providing a constant position setting correlated to a predetermined value of fluid pressure or temperature conditions for the other of said one condition to which said sensing means is sensitive;

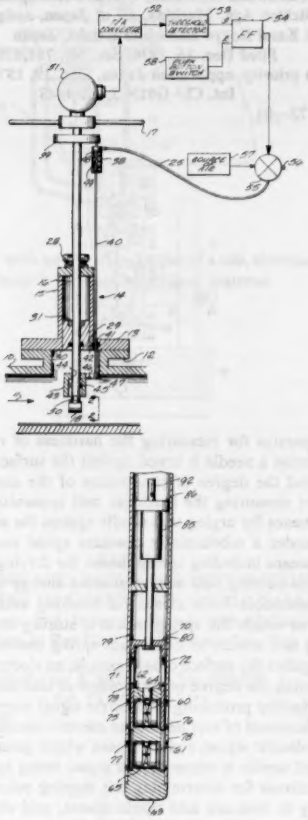
(c) multiplier means separately receiving both said sensing means displacement motion and the constant value of said input means to produce an integrated output displacement motion correlated to the multiplication product thereof;
(d) a corrected readout register;
(e) drive means operative by the meter at a rate proportional to the actual fluid volume being metered; and
(f) positionably resettable adjustment means operatively connecting said drive means to said register and resettable



by the output of said multiplier means to incur changes in position setting in correlation to changes in the output displacement motion of said multiplier means, said changes in position setting occurring at reset intervals proportional to the operational rate of said drive means whereby to effect a variable ratio drive advance of said register relative to the drive rate of said drive means as an integrated function of inputs provided to said multiplier means by said input means and said sensing means.

4,111,043
TURBINE FLOWMETER
James F. Guthrie, and Richard E. Zimmerman, both of Tempe, Ariz., assignors to Flow Technology, Inc., Phoenix, Ariz.
Filed May 25, 1977, Ser. No. 800,557
Int. Cl.[2] G01F *1/115, 7/00*
U.S. Cl. 73—197 **17 Claims**

11. A dual range turbine flowmeter comprising:
a first turbine wheel supported for rotation about its axis in a fluid line through which a fluid stream flows;
a second turbine wheel having different flow responsive rotational characteristics than the first turbine wheel supported for rotation about its axis in the fluid line;
means for sensing the rotation of at least one of the first and second turbine wheels; and
means responsive to the sensing means for alternately permitting the fluid stream to pass either the first turbine wheel or the second turbine wheel in alignment with its axis so such turbine wheel is operative, while the other

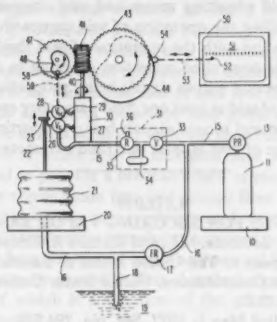


turbine wheel is inoperative without diverting the fluid flowing through the line.

4,111,044
FLOW MONITORING
Charles A. McClure, 5 Laurel Cir., Malvern, Pa. 19355
Filed Dec. 10, 1976, Ser. No. 749,276
Int. Cl.[2] G01F *1/20*
U.S. Cl. 73—215 **10 Claims**

1. Flow monitoring apparatus for use in an open channel, comprising means adapted to be positioned adjacent the bed of the channel for pneumatically sensing pressure of overlying liquid as depth thereof, means for characterizing depth as flow of liquid, means for recording liquid flow, and pneumatically actuated means for transmitting changes in sensed depth from

the sensing means to the flow characterizing means and including means for accumulating gradually increasing pneumatic



pressure and means for releasing such accumulated pressure intermittently to actuate the flow characterizing means.

4,111,045

AIR FLOW METER

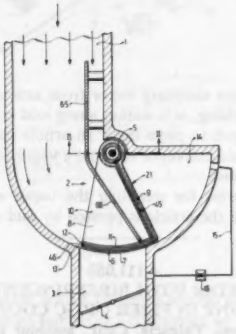
Rudolf Sauer, Bernhausen, and Dieter Vogt, Korntal-Münchingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,788

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637466

Int. Cl.² G01F *1/82*

U.S. Cl. 73—228 **5 Claims**



1. A flow meter for metering the air quantity aspirated by an internal combustion engine through an air flow tube, the flow tube defining an air stream which is directed as the aspirated air quantity into the engine comprising:

(a) a metering valve element constructed as a box-like cylindrical segment pivotably mounted in the flow tube in opposition to a restoring force and transversely relative to the direction of the air stream; and

(b) means connected to the valve element for providing the restoring force to the valve element, and wherein:

(i) the box-like cylindrical segment includes: a radial transverse wall oriented transversely relative to the direction of the air stream; side walls oriented parallel relative to the direction of the air stream; and a curved cylinder wall connected to the radial transverse wall and the side walls, said walls defining a recess which opens in a direction opposing the direction of the air stream; and

(ii) the deflection of the valve element against the restoring force represents a measure of the air quantity flowing through the flow tube.

4,111,046

TURBINE METERS

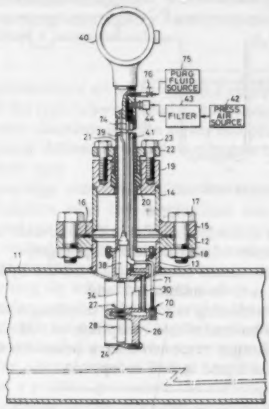
Hiroyuki Amemori, Kawasaki; Hideki Izumi, Tsuchiura, and Katsuyuki Tanaka, Tamatsukuri, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Mar. 30, 1977, Ser. No. 783,019

Claims priority, application Japan, Apr. 2, 1976, 51-37483; Sep. 27, 1976, 51-115673

Int. Cl.² G01F *1/115*

U.S. Cl. 73—231 R **6 Claims**



1. A turbine meter comprising:

a casing of substantially hollow cylindrical shape installed within a conduit through which a fluid to be measured is flowing, said casing having an outer diameter less than the minimum cross sectional dimension of the conduit;

an axle member supported by a support member within the casing and having an annular recess therearound;

a longitudinal flow passage formed in the axle member;

a plurality of discharge holes formed in the axle member to connect communicatively the annular recess and the flow passage;

a first supply pipe inserted into said conduit through the wall thereof and functioning to supply a pressurized fluid from a pressurized fluid source disposed outside of the conduit to said flow passage in the axle member;

a vane wheel comprising a hub disposed around the axle member and within said annular recess with minute gaps therebetween and adapted to rotate in a substantially non-contacting state relative to the axle member and a plurality of vanes implantedly fixed at their root parts to the hub, said vane wheel being rotated by a portion of the fluid being measured and flowing through the casing;

means for detecting the rotation of the vane wheel;

a nozzle having at least one nozzle orifice disposed in the vicinity of the axle member and vane wheel; and

a second supply pipe installed to extend through the wall of said conduit and functioning to supply a purging fluid to said nozzle, said nozzle purging the purging fluid through the nozzle orifice supplied from the second supply pipe towards the axle member and the vane wheel.

4,111,047

HYDROSTATIC HEAD PRESSURE MONITOR WITH REMOTE READOUT

John M. Bailey, Houston, Tex., assignor to Monitoring Systems Inc., Thibodaux, La.

Filed Jan. 12, 1977, Ser. No. 758,824

Int. Cl.² G01F *23/16*

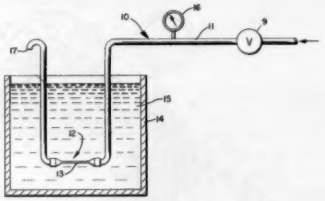
U.S. Cl. 73—302 **9 Claims**

1. A fluid line pressure monitor with remote readout for use

in a fluid pressurized system having a pipe line through which a fluid flow passes to a connected vent line comprising:

(a) a flexible diaphragm of two rectangular flexible members having their edges fused together along their length and maintained in a normally collapsed state in absence of fluid flow,

(b) the ends of a break in the pipe line being inserted into opposite ends of said diaphragm, so that the fluid flow passes through the inside of and between said two flexible members,



(c) pressure indicating means in fluid circuit with the pipe line upstream of said flexible diaphragm,

(d) receptacle means containing a fluid the hydrostatic head of which is to be monitored, and

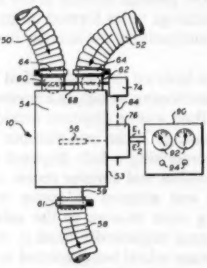
(e) means positioning said flexible diaphragm at a fixed level above the bottom of said receptacle to make the outside of said diaphragm responsive to a preselected hydrostatic head of the liquid in said receptacle.

4,111,048

FLUID PARAMETER SENSING APPARATUS

Robert E. Zuckerman, 36 Red Spring La., Glen Cove, 11542, and Michael J. Merendino, 1441 E. 64th St., Brooklyn, both of N.Y. 11234

Filed Mar. 21, 1977, Ser. No. 779,736
Int. Cl.[2] G01N *25/62*
U.S. Cl. 73—338 **11 Claims**



1. In a fluid parameter sensing apparatus for use in a fluid system having a plurality of fluid flow paths, said fluid parameter sensing apparatus being of the type including means for comparing one value of at least one fluid parameter as sensed at a first location in said fluid system with at leas one other value of said at least one fluid parameter as sensed at at least a second location in said fluid system, the improvement comprising:

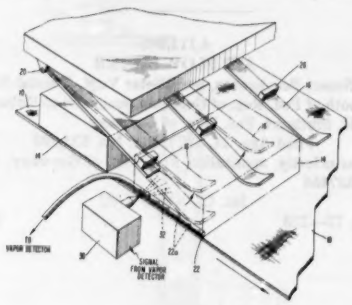
a housing defining a pneumatic chamber, first means for feeding a stream of said fluid from said first location to said housing; second means for feeding a stream of said fluid from said second location to said housing; means for alternately admitting fluid from said first and second fluid stream feeding means to said chamber; sensing means disposed in said chamber for providing an output signal proportional to said at least one fluid parameter; means connected to the output of said sensing means for comparing a first output signal provided by said sensing means with a second output signal provided by said sensing means, said second signal being spaced in time relative to said first signal; and motor means operatively connected to said fluid admitting means and said comparing means for controlling the operation of said comparing means in sychronization with the operation of said fluid admitting means, said controlled operation resulting in one of said first and second output signals being proportional to said one value of said at least one fluid parameter and the other of said first and second signals being proportional to said other value of said at least one fluid parameter.

4,111,049

APPARATUS FOR SECURING VAPOR SAMPLES

Melvin Lerner, Bethesda, Md., and Richard A. Ericson, Shelton, Wash., assignors to The United States of America as represented by the Commissioner, United States Customs Service, Washington, D.C.

Filed May 6, 1977, Ser. No. 794,572
Int. Cl.[2] G01N *1/22*
U.S. Cl. 73—421.5 R **13 Claims**



1. Apparatus for sampling vapor from articles carried by a conveyor comprising, at a station along said conveyor:

an arm arranged to press upon an article carried past said station by said conveyor to cause a vapor to be emitted by the article, and

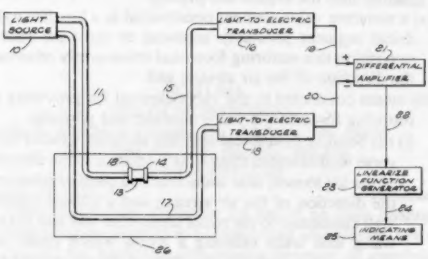
a sampling probe for sampling the vapor emitted by the article when the article is pressed by said arm.

4,111,050

THERMOMETER WITH BIREFRINGENT SENSING ELEMENT IN FIBER OPTIC COUPLING

Ray O. Waddoups, Valencia, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 14, 1977, Ser. No. 815,689
Int. Cl.[2] G01K *11/14*
U.S. Cl. 73—362 R **12 Claims**



1. A temperature-measuring device comprising:

a light source;

first and second fiber optic light conductors, said first light conductor being arranged to receive light energy from said light source at a first end thereof;

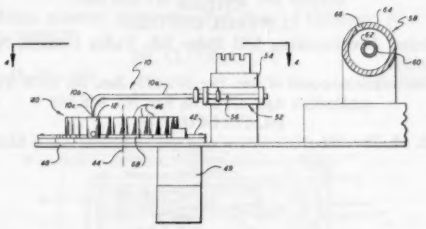
a birefringent optical element having a refractive index which is variable to produce a correspondingly variable polarization plane rotation as a function of temperature with input and output polarizers arranged to receive light energy from the second end of said first light conductor through said input polarizer, said birefringent element being in thermal contact with the environment, the temperature of which is to be measured, said polarizers being oriented to provide a predetermined relatively low value of light transmission into said second fiber optic conductor corresponding to a predetermined temperature;

and a light-to-electric transducer arranged to receive light energy from the second end of said second fiber optic light conductor to provide a first electrical signal, the magnitude of which is a function of the temperature of said environment.

4,111,051
SAMPLING PROCEDURE AND DEVICE FOR FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY

Rolf Günther Arnold Tamm, and Bernhard Werner Huber, both of Überlingen, Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Überlingen, Fed. Rep. of Germany

Continuation of Ser. No. 660,194, Feb. 20, 1976, abandoned.
This application May 21, 1976, Ser. No. 688,785
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1975, 2507260
Int. Cl.² G01N *1/14*
U.S. Cl. 73—423 A **13 Claims**



1. In combination with a flameless atomic absorption atomizer having a heated sample cell containing an aperture for the introduction of a liquid sample, an automatic sample, an automatic sample transfer apparatus comprising:

a. a sample probe having an elongate tubular portion terminating at one end in a tip extending at an angle to the elongate portion;

b. a probe displacement mechanism for sequentially and repetitively moving said probe from a first position, where the probe tip is immersed in a liquid sample or rinsing liquid to a second position in which the tip is aligned with said aperture; and

c. fluid pump and conduit means associated with said probe for discharging a quantity of rinse liquid through the probe tip, followed by aspiration of a batch of sample liquid into the probe, both at said first position, and discharging said batch of sample liquid into said aperture with the probe in said second position;

d. said rinse liquid being introduced into the probe by said pump and conduit means via the end of the probe's tubular portion remote from said tip; and

e. said pump and conduit means causing aspiration of a slug of air into the probe before aspiration of the sample liquid.

4,111,052
PRESSURE-SENSITIVE WRITING STYLUS

Albert Sniderman, W. Bloomfield, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 29, 1977, Ser. No. 828,314
Int. Cl.² G01D *9/02*
U.S. Cl. 73—432 R **10 Claims**

1. A pressure-sensitive stylus for use in a personal identification system of the type wherein handwriting pressure is used as the identification discriminant, the stylus comprising:

a stylus housing defined by a hollow elongate body having a longitudinal axis;

a stylus cartridge mounted within the stylus housing in aligned relation with the longitudinal axis thereof, the stylus cartridge having a writing tip at one end for contacting a record surface, and a bearing surface at the other end for transmitting the reactive force caused by contact of the writing tip with the record surface;

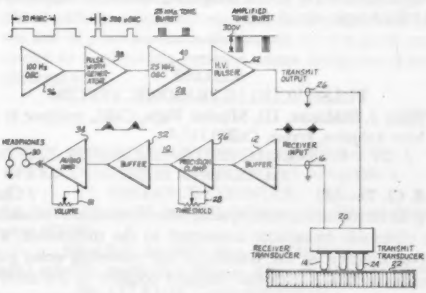
a hollow casing member disposed within the stylus housing in aligned relation with the longitudinal axis thereof, and being shaped and dimensioned to receive the stylus cartridge, the casing member being secured to the stylus housing at a position proximate the cartridge writing tip, and being closed at the other end to receive the reactive force transmitted by the bearing surface; and

transducer means, associated with the hollow casing member and responsive to the force transmitted by the stylus cartridge thereto, for providing a signal representative of the transmitted force as an indication of the handwriting pressure.

4,111,053
AUDIBLE BOND TESTER

Glenn Allen Geithman, Renton, and Wayne Earl Woodmansee, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 24, 1977, Ser. No. 809,872
Int. Cl.² G01N *29/00*
U.S. Cl. 73—588 **3 Claims**



2. Apparatus for ultrasonic inspection of a work piece comprising:

receiving and transmitting piezoelectric transducer elements adapted to be positioned in acoustically coupled relationship to the work piece;

a fixed frequency tone modulated transmitting circuit for providing tone bursts at a predetermined ultrasonic frequency at a constant repetition rate having a frequency less than said predetermined ultrasonic frequency, said

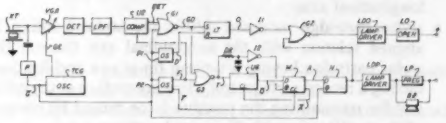
transmitting circuit connected to energize said transmitting piezoelectric transducer element and vibrate said work piece at said predetermined ultrasonic frequency; and, receiver circuit means connected to said receiving piezoelectric transducer element for providing an audio output signal at the tone burst repetition frequency having an amplitude level responsive to detection of a flaw condition in said work piece.

4,111,054

GRAVIDITY DETECTION METHOD AND APPARATUS

Hans G. Jorgensen, and B. Wendell Hautaniemi, both of Ithaca, N.Y., assignors to Ithaco, Incorporated, Ithaca, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,556
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—611 **10 Claims**



1. Apparatus for detecting pregnancy within an animal, comprising, in combination: ultrasonic transmission and reception means for transmitting ultrasonic energy into said animal and receiving reflected energy in the form of electrical echo signal pulses occurring during a reception interval following transmission of said energy; first means for detecting the occurrence of an echo signal which occurs during said reception interval later than a first predetermined amount of time after said transmission and for providing a first logic signal upon detection of any such echo signal; second means for detecting the occurrence of each echo signal which occurs during said reception interval later than a second predetermined amount of time after said transmission, for providing a second logic signal if and when no echo signal has been detected for a third predetermined amount of time elapsed at any time during said reception interval after said second predetermined amount of time has elapsed, and for providing a third logic signal if an echo signal is detected after provision of said second logic signal; and indicating means responsive to said logic signals for providing a pregnancy indication upon occurrence of said third logic signal and for providing a non-pregnancy indication upon occurrence of said first logic signal and no occurrence of said third logic signal.

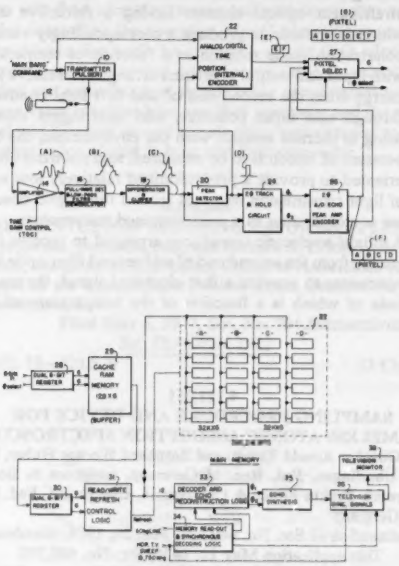
4,111,055

PULSE ECHO ULTRASONIC SYSTEM

William J. Skidmore, III, Mission Viejo, Calif., assignor to Del Mar Avionics, Irvine, Calif.

Filed Oct. 11, 1977, Ser. No. 840,733
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—620 **7 Claims**

1. In an ultrasonic echo system which includes a transmitter, an ultrasonic transducer connected to the transmitter, a receiver coupled to the transducer for receiving echo pulses therefrom, and a television monitor coupled to the receiver, said receiver including: an analog-digital time position encoder for producing a first digital signal representing the time position of the peak amplitude of each received echo pulse within a predetermined sample period; an analog-digital peak amplitude encoder for producing a second digital signal representing the peak amplitude of each of said received echo pulses; digital memory means storing multi-bit digital words representing different gray levels; means coupled to the time position encoder and to the peak amplitude encoder for introducing the first and second digital signals therefrom as multi-bit words to the digital memory means; and means for deriving a plurality of multi-bit words from the digital memory means representing



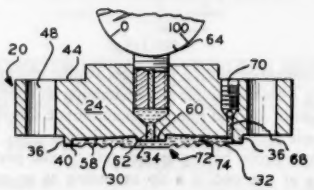
different gray levels in response to each such multi-bit word introduced to said digital memory means.

4,111,056

CONTROL DEVICES

Michael Mastromatteo, 53B Ridge Rd., Valley Cottage, N.Y. 10989

Continuation-in-part of Ser. No. 591,423, Jun. 30, 1975. This application Apr. 12, 1976, Ser. No. 676,335
Int. Cl.[2] G01L *7/08*
U.S. Cl. 73—706 **6 Claims**



1. A control mechanism of the type employing a liquid therein, comprising:

(a) a housing comprising upper and lower housing members of rigid material having a cavity; said cavity having a symmetrical configuration;

(b) a generally symmetrically shaped diaphragm secured between said upper and lower housings, thereby dividing said cavity into at least a first and second chamber; the first chamber being adapted to receive therein the liquid;

(c) a valve member formed in a central portion of said diaphragm;

(d) a boss extending from within said first housing and forming a valve seat; said housing having a first conduit port extending through said boss for admitting the liquid into said first chamber; said valve member being in registry

with said valve seat; valve seat having a substantially planar end for abutting said valve member to form said valve; said valve seat being so spaced from said diaphragm such that, upon said valve closing, said diaphragm being within its spring rate; said diaphragm having a plurality of concentric convolutions about said valve member; said valve member being coated with Teflon for sealing shut said valve; said valve being disposed substantially at the symmetrical center of said cavity;

(e) said diaphragm, in combination with said housing wall, comprising means for entrapping within said first chamber and so disposed such that, upon a result of force being applied in a predetermined direction to said diaphragm and said valve closing, said entrapping means, as a result of the force, thereby entrapping at least a part of the liquid within said first chamber, so that the entrapped liquid prevents the diaphragm means from being damaged by the force, thereby entrapping at least a part of the liquid within said first chamber, so that the entrapped liquid provides a cushion and hydrostatic stop to prevent said diaphragm from being damaged by the force;

(f) said housing having a second chamber port for communicating a substance through said second chamber to thereby move said diaphragm to thereby operate said valve; and

(g) said housing having a bleed port at the periphery of said cavity and extending through said upper housing for filling liquid therein or removing air from said chamber.

4,111,057

DUAL-INDICATOR MANOMETER FOR AN ELECTROMEDICAL DEVICE

Karl-Heinz Affeldt, and Gerhard Raupach, both of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 23, 1977, Ser. No. 836,234

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650627

Int. Cl.[2] G01L *7/00*

U.S. Cl. 73—709 **4 Claims**

1. In a dual indicator manometer for an electromedical device for measuring and indicating the systolic and diastolic blood pressure values of a patient, which manometer includes two pressure indicators, each having a motion transmitting shaft, and two braking members each associated with a respective indicator and including an electromagnet for controlling movement of its respective indicator for selectively blocking or releasing the shaft of the respective indicator, the improvement wherein each said braking member constitutes an armature associated with its respective electromagnet and having the form of a two-armed lever which is pivotal about a fixed axis, with one free end of said lever facing its associated electromagnet and the other free end of said lever facing its associated shaft, each said lever being pivotally movable, in response to the actuation state of said electromagnet, between a blocking position in which said braking member is pressed directly against the surface of said shaft of its associated indicator and a release position in which said braking member is clear of that surface.

4,111,058

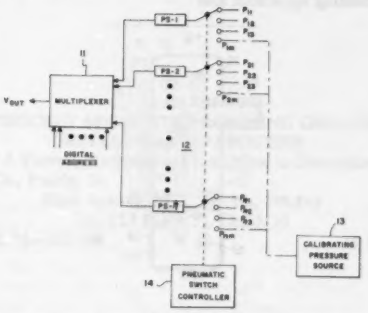
ELECTRICALLY SCANNED PRESSURE SENSOR MODULE WITH IN SITU CALIBRATION CAPABILITY

Chris Gross, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 22, 1977, Ser. No. 835,628

Int. Cl.[2] G01L *7/00, 9/06*

U.S. Cl. 73—714 **10 Claims**



1. A pressure sensor module comprising:

a pressure sensor substrate board including *n* pressure chips and a multiplexer thereon where *n* is a whole number greater than one;

said multiplexer connected to said pressure chips and including means such that when a digital code is applied to said multiplexer the analog outputs of said pressure chips sequentially appear at the output of said multiplexer;

a stator plate with *n* ports through it with each port on one side of the stator plate terminating onto a corresponding one of said pressure chips;

a pressure multiplexer plate in contact with the side other than said one side of the stator plate;

said pressure multiplexer plate having *n* groups of *m* ports through it where *m* is a whole number greater than one;

means for connecting *n* of said ports in said pressure multiplexer plate to a calibrating pressure source;

means for connecting the other $n(m-1)$ ports in said pressure multiplexer plate to the locations where pressures are to be measured; and

means for selectively moving said pressure multiplexer plate to *m* positions with a different set of *n* ports through it alined with the *n* ports through said stator plate in each of the said *m* positions and with the said set of *n* ports connected to a calibrating pressure source being one of said different sets.

4,111,059

DEVICE FOR TRANSMITTING MOVEMENT TO A SPEED INDICATOR INSTRUMENT AND/OR A DISTANCE COUNTER

Jacques Andre Huret, 12, rue C.B. Metman, Neuilly-sur-Seine, France (92200)

Filed Feb. 24, 1977, Ser. No. 771,563

Claims priority, application France, Mar. 19, 1976, 76 08071

Int. Cl.[2] F16H *37/00;* G01P *3/00*

U.S. Cl. 74—12 **5 Claims**

1. An apparatus for transmitting movement from a vehicle wheel to a speed indicating and/or distance counting apparatus for use with a wheeled vehicle such as bicycle, lightweight motorcycle, or the like, said apparatus comprising:

a transmission casing;

an input shaft extending through a first face of said casing;

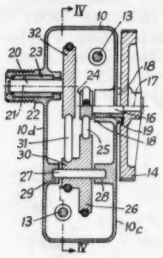
an output shaft extending through a second face of said casing opposite said first face thereof;

said input and output shafts being disposed in substantially parallel relationship;

a mechanical transmission system disposed within said casing for operatively connecting said input shaft to said output shaft, said transmission system being of the wheel and belt type;

each wheel of said transmission system having an axis of rotation parallel to said input and output shafts;

said output shaft being adapted to be connected to a flexible cable for driving said speed indicating and/or distance counting apparatus; and



a driving wheel attached to said input shaft on a portion thereof extending outside said casing;

said input shaft being offset in relation to a median plane of said casing parallel to said input and output shafts, whereby said driving wheel projects beyond a portion of the casing on one side thereof but not on an opposite side thereof;

said driving wheel being adapted to be driven by contact with a portion of the surface of a front tire or wheel of the vehicle, on the side of said casing from which it projects.

4,111,060

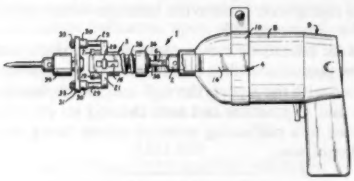
DRILL ATTACHMENT FOR CONVERTING ROTARY MOTION TO RECIPROCATORY MOTION

Fulvio Nerini, R.R. 1, Box 72-A, Bevier, Mo. 63532

Filed Nov. 22, 1976, Ser. No. 744,444

Int. Cl.[2] F16H *25/12;* **B27C** *9/00;* **B25D** *17/02*

U.S. Cl. 74—56 **8 Claims**



1. A drill attachment for converting rotary motion to reciprocatory motion and comprising:

(a) a guide bracket mounted on a drill housing and having a plurality of longitudinally extending arms;

(b) an elongated shaft having one end portion thereof adapted to be received in a drill chuck and an enlarged portion on the other end thereof;

(c) means on said shaft enlarged portion defining a plurality of circumferentially spaced cam surfaces surrounding the axis of said shaft;

(d) a tool support member movable longitudinally along and having a slideable connecting means slideably engaging without rotation said guide bracket arms and having one surface in facing relation with said enlarged portion of said shaft, said tool support member one surface having means thereon defining a plurality of circumferentially spaced cam surfaces engageable with said cam surfaces on said shaft enlarged portion, said tool support member one surface being resiliently urged into engagement with said shaft enlarged portion and the cam surfaces thereon;

(e) a chuck mounted on said tool support member for retaining therein a selected tool, said chuck being movable with said tool support member;

(f) said elongated shaft includes abutment means mounted thereon and positioned intermediate the ends thereof;

(g) said tool support member includes a body portion and means thereon defining a recess in facing relation with said abutment means on said elongated shaft; and

(h) an elongated resilient member is sleeved on said elongated shaft with one end portion in engagement with said abutment means and an other end portion received in the recess in said body portion of said tool support member.

4,111,061

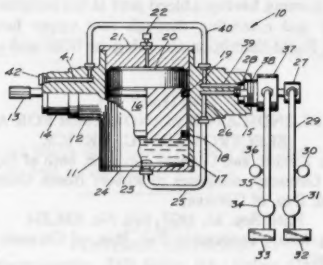
VARIABLE ECCENTRIC VIBRATION GENERATING MECHANISM

Hubert E. Thomas, 838 W. Mitchell Apt. 469, Arlington, Tex. 76013

Continuation-in-part of Ser. No. 764,721, Feb. 2, 1977, abandoned. This application Jul. 15, 1977, Ser. No. 815,935

Int. Cl.[2] F16H *33/00*

U.S. Cl. 74—61 **17 Claims**



1. A rotatable variable eccentric vibration generating mechanism wherein the improvement comprises a movable eccentric weight that is variably positioned by a controlled flow of fluid;

said mechanism including shaft body means between opposed bearing journals;

said mechanism including drive means on one end;

said mechanism including a fluid passage through said bearing journal on the opposed end;

said mechanism including a rotary fluid coupling fastened in part to said opposed end of the rotatable mechanism and fluidly connected with said bearing journal passage;

said mechanism including cylinder means;

said cylinder means fluidly connected with said bearing journal passage;

said mechanism including a fluid supply line connected to said rotary coupling;

said mechanism including a pressure gauge connected fluidly to record pressure in said cylinder means, passages, rotary coupling, supply line, and common parts;

said pressure record being convertible by computation to generated centrifugal force;

said mechanism including valve means to regulate the flow of fluid in and out of said supply line, rotary coupling, passages, cylinder means and common parts;

said flow of fluid controlling the position of the movable eccentric weight;

said regulation of flow and positioning of the movable eccentric weight being used to adjusted pressures within the cylinder means as required;

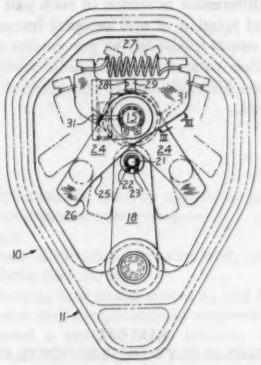
said mechanism including means to supply pressurized fluid;

said fluid supply line being also connected with pressure gauge means, valve means and pressure source means.

4,111,062
CONTROL MECHANISM FOR HYDROSTATIC TRANSMISSIONS

William I. Callaghan, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Jun. 24, 1977, Ser. No. 809,725
Int. Cl.[2] F16H *21/44;* G05G *7/04*
U.S. Cl. 74—96 9 Claims

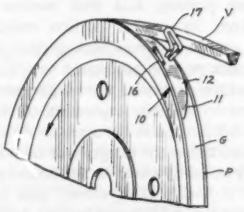


1. A control mechanism comprising:
rotatable output means,
rotatable input means,
a pair of lever means pivotally mounted for relative movement on said output means and disposed in scissored relationship relative to each other,
a camming surface defined on a first end of each of said lever means normally engaged with said input means for rotating on said output means in response to rotation of said input means,
biasing means connected between second ends of said lever means for normally urging them towards each other,
drive means connected to said output means and engageable between the second ends of said lever means, and
stop means secured on each of said lever means for engaging and pivoting the other one of said lever means in response to pivoting of said input means.

4,111,063
BELT ENRAILER AND DERAILER

John Journey, Haysville, Kans., assignor to Thexton Manufacturing Company, Minneapolis, Minn.

Filed Mar. 4, 1977, Ser. No. 774,248
Int. Cl.[2] F16H *7/08*
U.S. Cl. 74—242.6 11 Claims

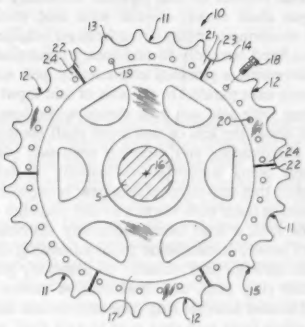


1. A V-belt enrailer and derailer for use with a grooved pulley, comprising
an elongate body to lie in the pulley groove and extend along a portion of the pulley periphery, the body having an outer side to lie adjacent the outer peripheral edge of the pulley when the body lies in the pulley groove;
a substantially rigid projection affixed to the body in substantially fixed relation, said projection extending transversely of the elongate body and outwardly from said outer side thereof for engaging and guiding a V-belt transversely of the pulley groove as the pulley is rotated, and
the elongate body being formed of stiff but flexible material so as to conform to the peripheral contour of the pulley and frictionally adhere against slipping to the pulley surfaces in response to minimal pressure applied from the belt toward the pulley.

4,111,064
SPROCKET SEGMENTS PROVIDING GREATER RETENTION CAPABILITIES

Robert J. Purcell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 19, 1977, Ser. No. 788,863
Int. Cl.[2] F16H *55/12, 55/30*
U.S. Cl. 74—243 DR 15 Claims

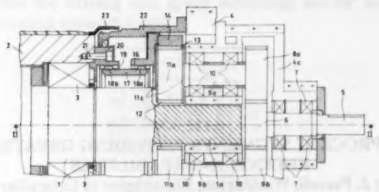


1. A chain drive sprocket comprising:
a hub;
a plurality of first sprocket segments each having a first plurality of sprocket teeth and a plurality of arcuately spaced mounting bolt holes; and
a plurality of second sprocket segments each having a second, different plurality of sprocket teeth and a plurality of arcuately spaced mounting bolt holes, said first and second sprocket segments being mounted seriatim alternately to said hub by a plurality of bolts to define a circular sprocket with said sprocket teeth thereof defining a continuous equiangularly spaced annular series and the bolt holes thereof defining a continuous equiangularly spaced annular series, the angular extent of said first segments being greater than the angular extent of said second segments, each segment defining opposite end surfaces spaced from the tip of the end teeth thereof an angular distance different from one-half the tip-to-tip angular spacing of said annular series of sprocket teeth whereby the radii of the sprockets centered between the confronting opposed end surfaces of each pair of segments are asymmetrically disposed relative to the radial centerline of the root between the end teeth of the segments at opposite sides of said confronting opposed end surfaces, each segment end surface being angularly spaced from said radial centerline less than the angular spacing thereof from the tip of the end tooth adjacent the end surface, the angular spacing of the end bolt holes from said segment end surfaces of said first sprocket segments being different from the angular spacing of the end bolt holes from the segment end surfaces of said second sprocket segments.

4,111,065
ROLL AND ROLL-DRIVING ASSEMBLY

Martti Matikainen, Pori, and Matti Sivonen, Jyväskylä, both of Finland, assignors to Valmet Oy, Finland

Filed May 5, 1977, Ser. No. 794,075
Claims priority, application Finland, May 6, 1976, 761280
Int. Cl.[2] F16H 57/00
U.S. Cl. 74—410 8 Claims

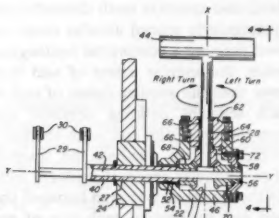


1. In a roll and roll-driving assembly, internal stationary shaft means, an outer shell surrounding said internal stationary shaft means and bearing means supporting said outer shell for rotation with respect to said internal stationary shaft means, rotary input shaft means coaxial with said stationary shaft means for receiving a rotary drive from an outside source, sun gear means fixed coaxially to said rotary input shaft means for rotation therewith, a plurality of planetary gear means respectively having axes parallel to the axis of said input shaft means and meshing with said sun gear means while being uniformly distributed about the axis of said input shaft means, an internal ring gear surrounding and meshing with said planetary gear means while being supported exclusively by said planetary gear means so that said internal ring gear is capable of automatically centering itself with respect to said plurality of planetary gear means with a load being uniformly distributed along a plurality of power-transmission paths extending from said sun gear means through said plurality of planetary gear means to said internal ring gear, and transmission means operatively connected to said internal ring gear and to said shell for transmitting a drive from said ring gear to said shell and for automatically compensating for inaccuracies and/or deformations.

4,111,066
CONTROL MEANS

Frank B. Kendrick, Franklin, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Nov. 10, 1976, Ser. No. 740,579
Int. Cl.[2] G05G 9/00
U.S. Cl. 74—471 R 6 Claims

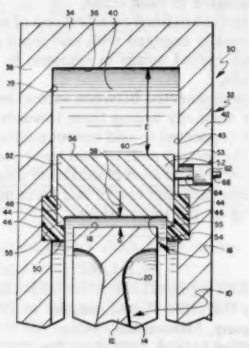


1. A manually operable control means adapted for selectively actuating at least a pair of actuatable means associated with a motive means, said control means comprising: an elongated control handle portion having a longitudinal axis; elongated rotary actuator means cooperable with such a pair of actuatable means and extending transversely with respect to said longitudinal axis of said handle portion; connecting means operatively connecting said handle portion to said actuator means and including means for locating said handle portion adjacent one longitudinal end of said actuator means and rotary connector means cooperable with said handle portion and said actuator means; said operative connection providing axial rotation of said actuator means in a first rotation mode responsive solely to rotation of said handle portion about said longitudinal axis for differential actuation of such pair of actuatable means and axial rotation of said actuator means in a second rotation mode responsive solely to movements of said handle portion other than rotation of said handle portion about said longitudinal axis for concomitant actuation of such pair of actuatable means.

4,111,067
RUPTURABLE FLYWHEEL ENERGY SYSTEM

Donald R. Hodson, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 10, 1977, Ser. No. 758,103
Int. Cl.[2] G05G 1/00; F16F 15/30
U.S. Cl. 74—572 2 Claims



1. In a flywheel system wherein rotary motion is utilized as a source of energy, the improvement which comprises:

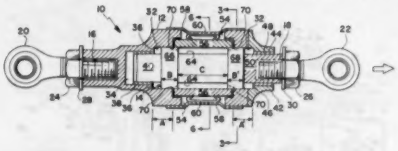
a substantially metal flywheel having a disk portion and an integral rim portion, said disk portion being evenly stressed from its central portion radially outwardly towards a narrowed-down neck portion formed by said disk, said neck portion positioned between said disk and said integral rim portion is more highly stressed than said disk portion to facilitate separation of said rim portion from said disk portion in the event of flywheel overstress thereby maintaining the integrity of said disk portion,

a substantially metal flywheel barrier housing concentrically positioned around said flywheel, said barrier housing being formed into a U-shaped trough, said trough having a first and second side perpendicular to the axis of said flywheel and a third end closure, said end being parallel with said axis, said first and second side partially overlapping at least the rim of said flywheel, said barrier further containing a substantially metal barrier ring surrounding said flywheel, said ring being slidable within said trough to absorb flywheel rim fragments in the event of rim separation from said flywheel, and

4,111,068
LOCKING REDUNDANT LINK

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Frank Henry Bonisch, Wethersfield, Conn.

Filed Mar. 7, 1977, Ser. No. 775,239
Int. Cl.[2] G05G *1/04;* B65C *27/42*
U.S. Cl. 74—586 14 Claims



1. An axially extensible strut, automatically lockable in both tension and compression, comprising:

a body means;

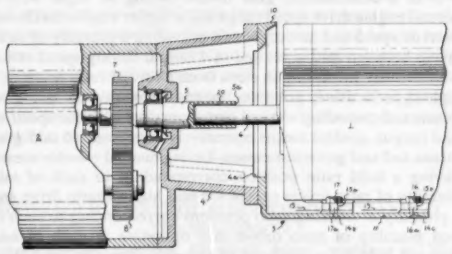
a piston means disposed within said body means and normally slidable therein, and

means for locking said piston means to said body means in both tension and compression in response to the piston being moved a predetermined distance in the tension direction and for locking said piston means to said body means in both tension and compression in response to the piston being moved a predetermined distance in the compression direction.

4,111,069
DRIVE MOTOR MOUNTING BASE FOR A GEAR MOTOR HAVING A C-FACED REDUCER

Ronald A. Blair, Pompton Plains; Gerhard A. Nickstadt, Oakland, and Gaetano O. Imbrogno, Hawthorne, all of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,181
Int. Cl.[2] F16H *57/02, 1/12*
U.S. Cl. 74—606 R 8 Claims

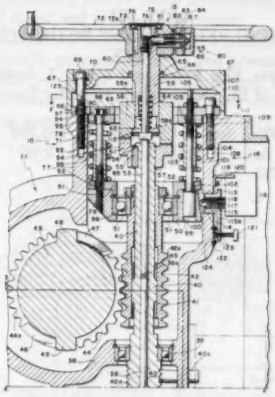


1. A mounting base for mounting a footed motor in driving relationship on a gear motor that has a C-faced reducer for supporting a motor in driving relationship thereon, said base having two walls positioned in orthogonal relationship, a first set of apertures formed at preselected locations through one of said walls and a second set of apertures formed at preselected locations through the other of said walls, the apertures of said first set being positioned to cooperate in generally aligned relationship with a third set of apertures formed in a motor abutting surface of a C-faced reducer, the apertures in said second set being positioned to cooperate in generally aligned relationship with a fourth set of mounting apertures each formed respectively through one of the feet of a footed drive motor, the surface of said one wall adapted to abut said C-faced reducer being machined to define a first plane, the surface of said other wall adapted for supporting the feet of a footed drive motor being machined to define a second plane that is substantially perpendicular to said first plane.

4,111,070
VALVE ACTUATOR AND SPRING BIASING CARTRIDGE

Andrew Stratienko, Philadelphia, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 4, 1977, Ser. No. 784,388
Int. Cl.[2] F16H *35/18*
U.S. Cl. 74—625 7 Claims



1. An improvement for a valve actuator mounted in a housing and adapted for rotation of a valve stem wherein the valve actuator has a ring gear means engageable with a rotatable valve stem; a sliding worm gear means engaged with the ring gear means; a clutch means on each end of the worm gear means to selectively alternately connect said worm gear means with a motor means or a manual operator means; and a spring means mounted with said worm gear means to provide resilient resistance to movement thereof wherein the improvement comprises said spring means being a spring cartridge assembly including:

a base plate having bearing means for receiving in rotatable relationship said worm gear means;

cylindrical openings in said base plate around said bearing means and spaced radially outward therefrom;

a lower spring abutment plate arranged to abut said base plate and movable relative to said housing and having a plurality of passages therethrough;

an upper spring abutment plate spaced above said lower plate and having a plurality of openings therethrough;

a top plate arranged to abut said upper spring abutment plate having a plurality of passages therethrough, a plurality of bolt-head openings therethrough, and means for directly securing said top plate to said housing;

first connection means extending through said bolt-head openings, some of said upper spring plate openings, some of said lower spring plate openings, being secured in said base plate, and having abutment head means thereon for abutting said upper spring plate;

second connection means secured to said top plate, extending downward through some of said openings in said upper and lower spring plates and into said cylindrical openings, and further having abutment means thereon for engagement in said cylindrical openings and abutment with said spring lower plate;

compression spring located between said upper spring plate and said lower spring plate and in compression therebetween;

said compression spring being compressed by displacement of said worm gear means in one direction which displaces said lower spring abutment plate from said base plate toward said upper spring abutment plate, and said compression spring being also compressed by motion of said worm gear means in the opposite direction whereupon

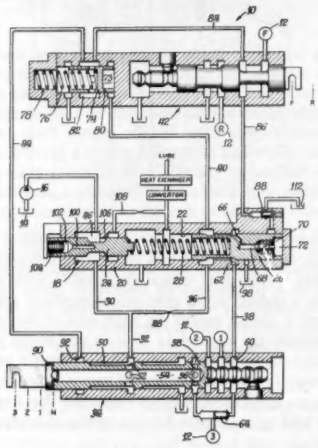
said upper spring abutment plate is displaced from said top plate toward said lower spring abutment plate.

4,111,071

MODULATING RELIEF VALVE WITH HYDRAULIC SAFETY

Shairyl I. Pearce, East Peoria, and Sidney J. Audiffred, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 6, 1974, Ser. No. 503,595
Int. Cl.[2] F16H *3/44*; F16D *19/00*
U.S. Cl. 74—753 **4 Claims**



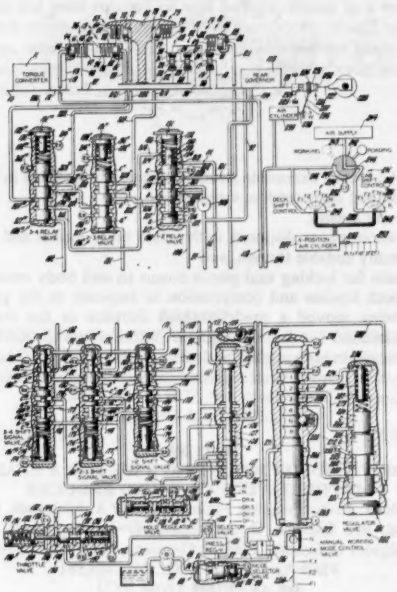
1. In combination with a transmission having a plurality of fluid pressure actuated drive conditioning devices, a fluid system comprising: a source of fluid pressure; safety valve means comprising a housing and a spool movable therein to first and second positions; means for biasing the safety valve spool into its first position; selector valve means having a plurality of drive conditioning positions, and a neutral position; means associated with the source of fluid pressure, selector valve means, and safety valve means so that upon initial selection of other than neutral position, the safety valve spool is in and remains in its first position so that fluid pressure is exhausted from the system to in turn prevent actuation of any of the drive conditioning devices, and upon movement of the selector valve means into said neutral position, fluid pressure is supplied to the safety valve spool to move it against said bias into its second position, to allow fluid pressure buildup in a selected drive conditioning device, determined by selection of a selector valve means drive conditioning position; modulating relief valve means associated with said fluid pressure source and comprising said housing and a modulating relief valve spool movable to a first position allowing fluid pressure to be supplied from said source to the safety valve means and selector valve means, and movable away from its first position to limit the level of fluid pressure supplied to said selector valve means; and means for biasing the modulating relief valve spool into its first position, wherein the means for biasing the safety valve spool into its first position, and the means for biasing the modulating relief valve spool into its first position, comprise a helical spring disposed between the safety valve spool and the modulating relief valve spool, whereby the safety valve spool acts as a load piston for the modulating relief valve spool.

4,111,072

TRANSMISSION WITH AUTOMATIC AND MANUAL CONTROL MODES

Kenneth B. Harmon, Indianapolis; Richard J. Koenig, Carmel, and Carl A. Lentz, Mooresville, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 9, 1977, Ser. No. 795,129
Int. Cl.[2] B60K *21/04*
U.S. Cl. 74—864 **7 Claims**

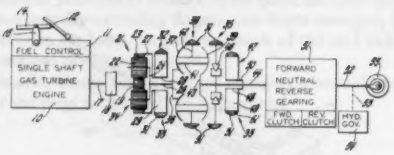


1. In a transmission: gear means having an input with a normal engine drive speed range and a higher engine maximum overrun speed and an output and providing a plurality of ratio drives between said input and said output having speed ratios continuously increasing in steps from a lowest ratio drive to a highest ratio drive; governor means connected to said gear means and providing a speed signal varying with the speed of said output; control means operatively connected to said gear means and said governor means, having manual selector means having a hold ratio position corresponding to each of said plurality of ratio drives except for said highest ratio drive and a plurality of working ratio positions corresponding to each of said plurality of ratio drives and operative in each of said selected hold ratio positions to provide automatic upshifting and downshifting in response to said speed signal between the corresponding selected hold ratio drive and any lower ratio drives of said plurality of ratio drives to provide optimum drive of said output with said input in said drive speed range, operative in each of the selected working ratio positions to provide the corresponding selected working ratio drive throughout said drive speed range to provide output speed in a constant ratio drive proportion to input speed and controllable by engine throttle control of input speed, and operative in each of said selected hold ratio drives and each of said selected working ratio drives to provide hold shifting between either the selected hold ratio drive or the selected working ratio drive and a higher ratio drive having an upshift at the maximum overrun output speed in the selected hold ratio drive and working ratio drive to prevent input speed exceeding maximum overrun speed and a downshift from the higher ratio drive at a lower output speed to provide input speed which is a hysteresis amount less than maximum overrun engine speed after said downshift.

4,111,073
PROGRESSIVELY VARIABLE TRANSMISSION

Howard E. Chana, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 17, 1977, Ser. No. 759,800
Int. Cl.[2] B60K *41/18*
U.S. Cl. 74—865 23 Claims



1. In a power transmission: an input providing increasing input torque with increasing input speed; an output; planetary gear means having an input member driven by said input, a reaction member, and an output member for providing a constant torque multiplication ratio and a reduction speed ratio progressively increasing from zero to the reciprocal of the torque ratio as the reaction member speed is progressively reduced from the free rotation speed to zero speed; progressively variable ratio drive means having an input element connected for drive by said output member, an output element drive connected to said output and drive connecting said input element to said output element to progressively vary the speed ratio from a low reduction speed ratio to a high speed ratio and a torque ratio from a high torque multiplication ratio to a low torque multiplication ratio; progressively variable ratio transmission means driven by said reaction member and driving one of said elements providing progressively variable speed and torque ratio drive and speed ratio control of said planetary gear means; and control system means including speed governor means providing an output speed signal proportional to the speed of said output and ratio control means operative in response to said output speed signal in a low output speed range from zero output speed to a transistion output speed to control said progressively variable ratio drive means and to control said progressively variable ratio transmission means to provide the overall progressively variable speed ratio and torque ratio to multiply increasing input torque to provide substantially constant high total torque to said output from zero output speed to said transition output speed and decreasing total torque to said output as output speed increases above said transition output speed.

4,111,074
HYDRAULIC CONTROL FOR HYDROMECHANICAL TRANSMISSION

Robert Powers Northup, Pittsfield, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

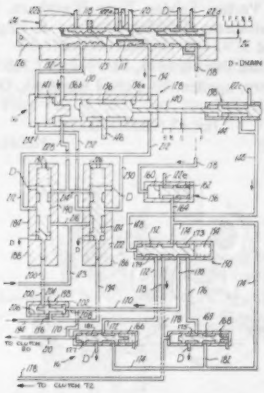
Filed Nov. 1, 1976, Ser. No. 737,378
Int. Cl.[2] B60K *21/00*
U.S. Cl. 74—867 1 Claim

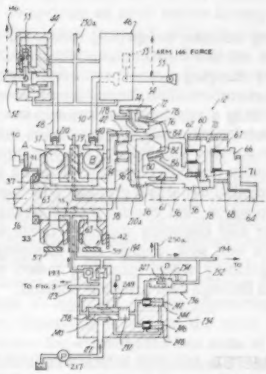
1. A hydromechanical transmission connectable between a prime mover and power-using device: said transmission comprising an input shaft (**36**); an output shaft (**64**); a hydrostatic pump-motor unit connected to the input shaft; control means (**44, 46**) associated with said pump-motor unit for varying the pump displacement and motor displacement; an epicycloidal gearing system connected to said shafts and to the pump-motor unit, said gearing system including two planet gear carriers (**62** and **56**);

a first hydraulically-operated clutch (**72**) for exerting a locking action on one of the planet carriers to establish a low output speed ratio drive path through the gearing system; a second hydraulically-operated clutch (**80**) for exerting a locking action on the other planet carrier to establish a high output speed ratio drive path through the gearing system;

an error signal means (**88**) for comparing prime mover speed and user demand speed; said signal means including a hydraulic input (**32, 98**) representing prime mover speed, a mechanical input (**24, 94**) representing user demand speed, and two separate hydraulic output signals (**118** and **120**) representing plus or minus differentials between user demand speed and prime mover speed;

a clutch selector valve (**150**) having an inlet (**164**) connected to a hydraulic pressure source, a first pressure outlet (**178**) connected to said first clutch for operating same, a second pressure outlet (**170**) connected to said second clutch for operating same, a third drain outlet (**172**) for the first





clutch, a fourth drain outlet (**176**) for the second clutch, and a flow diverter piston (**152**) movable in a reciprocatory fashion between (1) a first position wherein the inlet is connected to the first pressure outlet and the secnd pressure outlet is connected to the fourth drain outlet, and (2) a second position wherein the inlet is connected to the second pressure outlet and the first pressure outlet is connected to the third drain outlet;

means for operating the flow diverter piston comprising a spring means (**154**) and hydraulic means (**148**) controlled by a pilot valve (**138**) having a power piston (**136**); said power piston having opposed end faces (**136***a* and **136***b*) located to receive the aforementioned hydraulic signals (**118** and **120**), whereby said pilot valve is closed when

user demand speed exceeds prime mover speed and open when prime mover speed exceeds user demand speed;

means (166) for depressurizing the first clutch, comprising a piston (177) that is operated by a pressurized condition of the aforementioned second outlet to form a drain path from the third drain outlet;

means (168) for depressurizing the second clutch, comprising a piston (169) that is operated by a pressurized condition of the aforementioned first outlet to form a drain path from the fourth drain outlet;

and means (146) responsive to motion of the aforementioned power piston (136) for operating the aforementioned pump-motor control means (44, 46).

4,111,075
GRINDING MACHINE

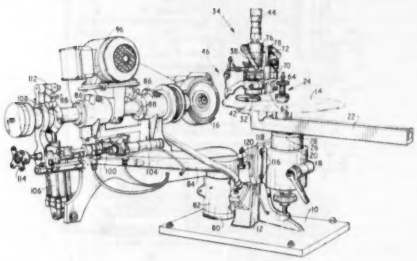
Bernard Scott Varley, Sabden, Near Blackburn, England, assignor to Automatic Grinding Machine & Engineering Co. Ltd., England

Filed Jun. 4, 1976, Ser. No. 692,715

Claims priority, application United Kingdom, Oct. 25, 1975, 43523/75

Int. Cl.² B23D *63/14*

U.S. Cl. 76—41 9 Claims



1. A grinding machine comprising means for supporting a circular saw or the like for rotation about its own axis; cyclically controlled clamping means for successively clamping and releasing said saw mounted on the machine at least in a zone of the saw adjacent to a grinding position, said saw being freely rotatable when released; cyclically controlled indexing means for the saw or the like mounted on the machine; a grinding wheel; a cyclically controlled means mounting said grinding wheel and adapted to move said grinding wheel into and out of said grinding position; and control means arranged to, in sequence, release said clamping means, activate said indexing means to index said saw, engage said clamping means and activate said grinding wheel mounting means to move said grinding wheel through said grinding position.

4,111,076
LIMITED ACCESS WIRE STRIPPER

James Rocha, 1108 Baywood, #152, Petaluma, Calif. 94952, and L. Dean Carter, 825 Gold Ridge Rd., Sebastopol, Calif. 95472

Filed Jul. 5, 1977, Ser. No. 813,154

Int. Cl.² H02G *1/12*

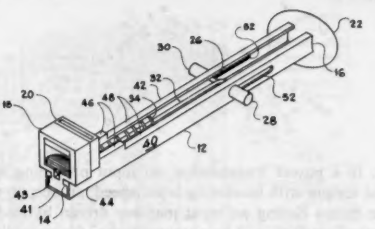
U.S. Cl. 81—9.5 A 8 Claims

1. Apparatus for removing insulation from an insulated wire, comprising:

an elongate frame member having opposed ends and an inclined surface intermediate the ends;

means on one end of the frame member for releasably clamping an end portion of the insulated wire;

means for cutting into and for separating the insulation on the end portion of the wire movable on the frame member from a first position adjacent the clamping means to a second position spaced from the clamping means, the clamping means being held out of clamping relationship with the end portion of the insulated wire when the cutting means is in said first position, the cutting means including a pair of relatively shiftable cutter blades and a magnet for attracting and releasably holding at least one of the cutter blades away from the other of the cutter blades when the cutter means is in the first position, the one of the blades being engageable with and movable along the inclined surface whereby movement of the



cutting means from the first position toward the second position causes the clamping means to engage and clamp the wire end portion and the cutter blades to be placed into insulation-cutting relationship;

means for biasing the cutting means toward said first position; and

means on the other end of the frame for moving the cutting means from the first position to the second position.

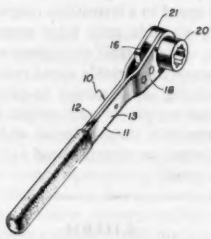
4,111,077
RATCHET WRENCH

Henry S. Cummings, and Richard P. Leone, both of Worcester, Mass., assignors to Lowell Corporation, Worcester, Mass.

Filed Feb. 2, 1977, Ser. No. 764,861

Int. Cl.² B25B *13/46*

U.S. Cl. 81—63 6 Claims



1. Ratchet apparatus, comprising:

(a) a main body consisting of two similar body elements formed of thin material, each element having an elongated flat panel portion connected to a centrally-apertured head portion which is offset laterally thereof, the handle portions of the two elements being fastened in face-to-face relationship with the head portion in spaced, parallel relationship,

(b) a generally annular sprocket formed with teeth on its outer periphery, rotatably carried in the apertures and held between the head portions,

(c) a generally semi-circular spacer element lying between the head portions at the outer parts thereof on the opposite sides of the apertures from the handle portions and surrounding a portion of the sprocket, said spacer element having an inwardly-directed protuberance at each end, the protuberances being adjacent the outer ends of the sprocket teeth, the spacer element being formed of a polymer and each protuberance being provided with a peg which engages an aperature in the head portion, the

peg being in the form of a rod whose axis is perpendicular to the head portions,

(d) a one-piece pawl carried between the head portions in the part thereof adjacent the handle portions for rotation about an axis perpendicular to the head portions, the pawl having two spaced, parallel teeth extending toward the sprocket and alternately engaging the sprocket teeth in the extreme positions of rotation of the pawl, the pawl having two laterally-extending fingers, one finger emerging from between the head portions and each of the said extreme positions of the pawl, and

(e) an over-center spring element engaging a control portion of the pawl facing the handle portions.

4,111,078

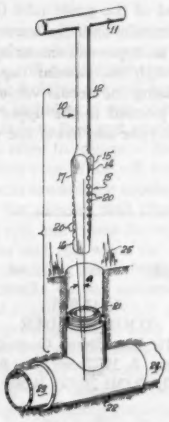
EXTRACTOR FOR PLASTIC RISERS

Paul Seamon, 6191 Anthony Ave., Garden Grove, Calif. 92645

Filed Apr. 4, 1977, Ser. No. 783,983

Int. Cl.[2] B25B *13/48*

U.S. Cl. 81—71 **4 Claims**



1. A device of the type for unscrewing plastic risers from threaded fittings such as a tee located in a sprinkler pipe, said device having a continuously tapered shank with four gripping edges, each gripping edge having a pointed ridge at its extremity, an extension rod affixed to said shank and handle means affixed to said extension rod, wherein the improvement comprises:

a plurality of serrations formed along the extremity of at least one of said gripping edges, said serrations having two sides in a plane perpendicular to the longitudinal axis of the device and one edge parallel to the longitudinal axis.

4,111,079

KEYS FOR DRILL CHUCKS

George Cecil Derbyshire, Sheffield, England, assignor to The Jacobs Manufacturing Company, Limited, Sheffield, England

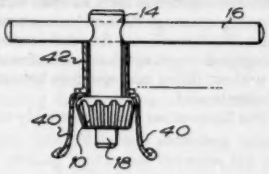
Filed May 18, 1977, Ser. No. 797,925

Claims priority, application United Kingdom, May 28, 1976, 22430/76

Int. Cl.[2] B25B *13/02*

U.S. Cl. 81—90 A **6 Claims**

1. In a drill chuck key having a geared head part and a pilot part, an ejector means for disengaging the key from a drill chuck when axial pressure on the key is released, in which said ejector means is constituted by an element having a pair of resilient limbs arranged to bear against the plain portion of a drill chuck in which the pilot holes are formed, said limbs being splayed out as the key is engaged with the chuck and



acting to withdraw the complete key from engagement with the chuck when said key is released by the user.

4,111,080

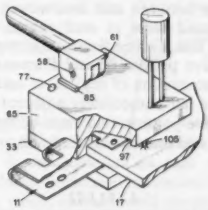
STAPLE FASTENING TOOL

Winston C. Pray, Lombard, Ill., assignor to Flexible Steel Lacing Company, Downers Grove, Ill.

Filed Feb. 4, 1977, Ser. No. 765,788

Int. Cl.[2] B23P *11/00*

U.S. Cl. 29—243.51 **12 Claims**



1. An applicator apparatus for securing hinge fasteners having alternating ribs to the end of a belt by staples, said applicator apparatus comprising an anvil means having an anvil surface for deflecting lower free ends of the staples to clinch the staples to the underside of the belt fasteners, a staple guide block means mounted over said anvil means with a portion thereof spaced from said anvil surface to admit a belt end therebetween, means mounting said staple guide block means for relative movement with respect to said anvil means between an open position admitting the belt end and a closed position for holding the belt for staple application, means for shifting said staple guide block means, means in said guide block defining vertically extending open shafts for receiving staples to be driven through said belt fasteners and the belt end, means for aligning the belt fasteners relative to said staple guide block means and to said anvil surfaces and including alternating slots to matingly receive alternating ribs in the hinge fastener, depending means on the outer edge of said guide block means for abutting the free ends of said belt fastener legs to hold said ribs of said fasteners in said slots during a stapling operation, and a resilient clamping means associated with said staple guide block means and said anvil means and engaging the belt end and applying a holding force thereto to resist shifting of the belt end during driving of the staples through the belt and the clinching of the staple ends.

4,111,081

LOW NON-LINEARITY FACTOR SOUND ATTENUATING LAMINATE

Lonnie George Hilliard, Kent, and Juris Verzemnieks, Puyallup, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 2, 1976, Ser. No. 646,347

Int. Cl.[2] G10K *11/04*

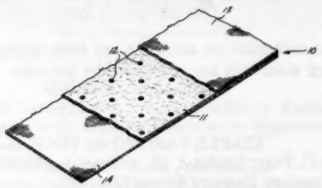
U.S. Cl. 181—290 **3 Claims**

1. A low non-linearity sound absorbent material for attenuat-

ing sound energy propagating through a moving gaseous media, said sound absorbent material comprising:

a first and second web having a plurality of filaments interwoven with one another to form an open weave cloth-like material having openings defined between adjacent interwoven filaments thereof, said first and second webs being resin impregnated to encapsulate each of said interwoven filaments without filling said openings between said interwoven filaments; and,

a relatively thin filamentous mat of randomly oriented fibers



interposed between said first and second webs, said filamentous mat including a predetermined pattern of adhesive, said adhesive penetrating through said mat and into said openings between said interwoven filaments of said first and second webs in each region of said first and second webs that is immediately adjacent to said predetermined adhesive pattern of said filamentous mat without substantial penetration of regions of said first and second webs that are not immediately adjacent to said predetermined adhesive pattern, said resin being cured to permanently bond said mat to said first and second webs.

4,111,082

CENTER ASSEMBLY INCLUDING OIL RESERVOIR FOR MACHINE TOOLS

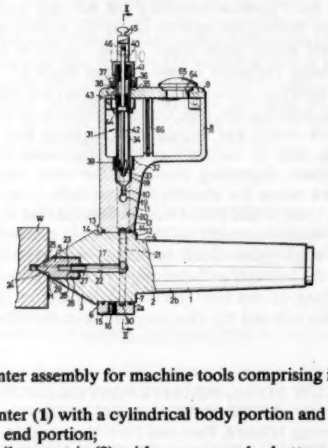
Kiyotaka Kohori, 40-4 3-chome, Aoyamadai, Suita, Osaka, Japan

Filed Jan. 21, 1977, Ser. No. 761,219

Claims priority, application Japan, Aug. 17, 1976, 51-98337; Aug. 23, 1976, 51-100826; Aug. 23, 1976, 51-113428[U]

Int. Cl.[2] B23B *23/02;* B23Q *11/12*

U.S. Cl. 82—33 R **3 Claims**



1. A center assembly for machine tools comprising in combination:

(a) a center (1) with a cylindrical body portion and a conical front end portion;

(b) an oil reservoir (8) with a cover and a bottom wall disposed above said center (1) having a leg (11) extending from its bottom wall and formed with a first bore (12) extending therethrough and with an oil passage (10) having a lower end opened to the bore (12) and an upper end opened in the inner surface of said bottom wall, said center (1) being rotatably coupled to said bore (12), a pump (52) to prevent clogging in said oil reservoir (8) including a vertical second bore (67) in said leg (11), a plunger (54) slidable in said vertical second bore (67) communicating with said oil passage (10), a spring (57) coupled to and upwardly biasing said plunger (54), and, a handle rod (53) integral with the plunger (54) extending outward through said reservoir cover;

(c) an oil channel (17) extending approximately along the geometric central line of said conical front end, said oil channel having one end opened to the outer peripheral surface of said cylindrical body portion in register with the lower end opening of said oil passage (10) and the outer end opened in said conical front end portion in the vicinity of its end; and,

(d) a downward biased needle valve coupled for opening and closing said oil passage upper end, said needle valve having:

a valve seat (32) fixedly fitted in the upper end opening of the oil passage (10), a guide tube (34) having a lower end bearing on the valve seat and an upper end projecting outward through said cover, an annular cap (41) secured to the upper end of the guide tube (34), a needle valve element (42) vertically slidably housed in the guide tube (34) and having an upper end extending outward from the guide tube through the annular cap, a spring (43) for downwardly biasing the needle valve element and a tiltable knob (45) pivoted to the upper end of the needle valve element to raise and lower the valve element.

4,111,083

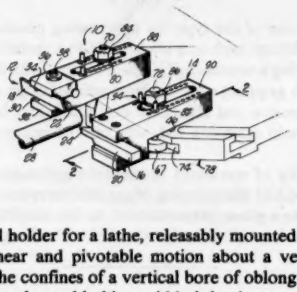
TOOL HOLDER

Walter L. Carter, 17156 Los Alimos, Granada Hills, Calif. 91344

Filed Aug. 8, 1977, Ser. No. 822,752

Int. Cl.[2] B23B *29/00;* B26D *1/12*

U.S. Cl. 82—36 A **13 Claims**



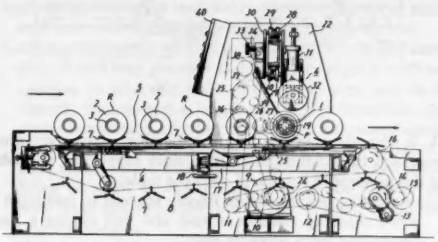
1. In a tool holder for a lathe, releasably mounted on a lathe turret for linear and pivotable motion about a vertical bolt received in the confines of a vertical bore of oblong cross-section traversing the tool holder, said bolt having one of its ends engageable in a groove formed in said lathe turret, said tool holder further comprising means for supporting a tool projecting outwardly therefrom to operate on a workpiece rotating about an axis, the improvement comprising

means for releasably positioning said tool holder with respect to said turret, said means including at least one pair of dowels, each dowel releasably inserted in, and depending from, one of a plurality of aligned, holes therefor vertically defined at predetermined locations through said tool holder, wherein the angular orientation of said holes marked by said inserted dowels, relative to the axis of rotation of said workpiece defines a predetermined alignment of said tool holder on said turret.

4,111,084
LUG END CUTTING APPARATUS FOR ROLL-LIKE PRODUCTS

Yukimichi Matsumoto, and Minoru Ueyama, both of Hirakata, Japan, assignors to Kabushiki Kaisha Fuji Tekkosho, Japan

Continuation-in-part of Ser. No. 643,142, Dec. 22, 1975. This application Mar. 11, 1977, Ser. No. 776,900
Claims priority, application Japan, Dec. 29, 1974, 50-921
Int. Cl.[2] B23B *7/14, 15/00*
U.S. Cl. 82—48 **12 Claims**



1. Apparatus for trimming both ends of a roll composed of sheet material wound on a hollow core, comprising conveying means for carrying a roll horizontally to a trimming position, supporting means for holding the roll horizontally and rotatably at said position including a pair of rotatable chucks disposed horizontally face-to-face and adapted to move toward and away from each other to engage or disengage with respective ends of the hollow core of the roll from both sides, means for moving said chucks toward one another to engage opposite ends of a roll and for moving said chucks away from one another to release a roll, and means for rotating at least one of said chucks to rotate said roll when the chucks are engaged with a roll, a pair of detecting means for detecting both ends of a roll held by said chucks, cutting means comprising a pair of disk cutters disposed coaxially with each other in parallel with the axis of said supporting means, each of said disk cutters having a flat face and a circumferentially acute-angled surface defining a cutting edge, said disk cutters being arranged with their flat faces facing each other and their circumferentially acute-angled edge surfaces facing outwardly, said disk cutters being capable of moving toward and away from each other and of lowering vertically so as to cut off from both ends of a roll held and rotated by said supporting means, means controlled by said detecting means for moving said disk cutters toward one another and means for lowering and raising said disk cutters, and control means including instruction circuits for controlling the sequence of operation of said apparatus to convey a roll to said trimming position by said conveying means, move said chucks toward one another to engage opposite ends of said roll, rotate at least one of said chucks while thus engaged to rotate said roll, operate said detecting means to detect both ends of said roll, move said disk cutters toward one another under control of said detecting means to position them with respect to the ends of said roll, lower said disk cutters to trim both ends of said roll as it is rotated by said chucks, raise said disk cutters, and move said chucks away from one another to release the trimmed roll for removal by said conveying means.

4,111,085
COMPOUND CURVATURE CUTTING MACHINE

George William Johnson, Smyrna, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed May 10, 1977, Ser. No. 781,694
Int. Cl.[2] B26D *3/10;* **B23D** *53/08*
U.S. Cl. 83—1 **6 Claims**

1. A multi-axis cutting machine for cutting compound curvature surface on a workpiece comprising:

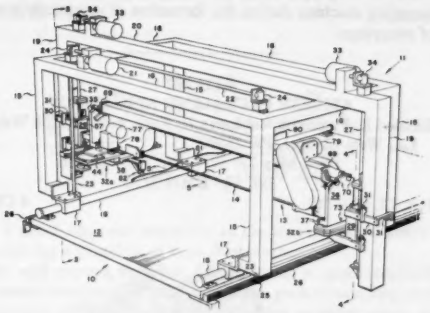
a machine bed means adapted to receive and retain a workpiece in secure fashion thereon and having a guiderail means extending along two opposite side edges thereof;

a gantry means movably mounted on said guiderail means whereby a relative longitudinal movement between the gantry means and the machine bed means may be accomplished to constitute movement in an X-axis;

a cutting means assembly including a straight-line workpiece cutting means member:

means mounting the cutting means assembly to the gantry means;

a first means included in said mounting means whereby a relative vertical movement between the cutting means assembly and the machine bed means may be accomplished to constitute movement in a Y-axis for the cutting means member relative to said machine bed means;

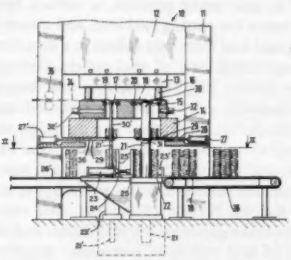


and a second means included in said mounting means whereby a relative horizontal movement between one end of the cutting means assembly and the machine bed means may be accomplished to constitute an Angle-*b* pivotal movement about the Y-axis, each said first and second means in said mounting means and said movable gantry means independently and variably operable relative to each of the others whereby the surface generated on the workpiece in a single traversement of the X-axis can consist of a compound curvature of any variable combination of straight lines relative to the X-, Y- and Angle-*b* axes.

4,111,086
ALIGNING AND STACKING ARRANGEMENT

Karl Dangelmaier, Göppingen-Holzhiem, Fed. Rep. of Germany, assignor to L. Schuler GmbH, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 782,744
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630867
Int. Cl.[2] B21D *43/20*
U.S. Cl. 83—90 **28 Claims**



1. An alignment and stacking arrangement for stampings manufactured in a continuous stamping operation by a stamping machine having a punch and an associated punch matrix, the alignment and stacking arrangement comprising: at least

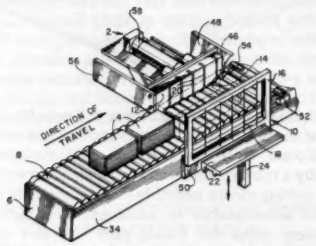
one stacking channel means arranged at the punch matrix for receiving stampings produced by the stamping machine during a continuous stamping operation, means for forming an intermediate stack of stampings upon a produced stack of stampings reaching a predetermined height, at least one mandrel means arranged within said at least one stacking channel means for receiving an intermediate stack of stampings during the formation of an intermediate stack of stampings, means arranged on the stamping machine at a position below and independent of the punch matrix for holding said mandrel means within said at least one stacking channel means during the formation of an intermediate stack of stampings, and means for conveying the stack of stampings having the predetermined height from the stamping machine during the formation of intermediate stack of stampings.

4,111,087

CHEESE PACKAGING APPARATUS

Richard R. Pankratz, and Larry R. Kegg, both of 1230 Wright's La., West Chester, Pa. 19380

Filed May 27, 1977, Ser. No. 801,316
Int. Cl.² B26D *5/20*
U.S. Cl. 83—210 **4 Claims**



1. A cheese packaging apparatus for handling loaves of cheese, while maintaining the structural integrity of the loaves which comprises:

conveyor means for transporting the cheese, having a plurality of rotatable driven rollers each having a longitudinal axis upon which loaves of cheese are placed, which are translationally stationary, and wherein said rollers include first means for permitting a loaf of cheese to be stopped from moving along said conveyor if it impacts a barrier while permitting a loaf of cheese not impacting a barrier to be transported;

a cheese cutter adapted to receive loaves of cheese from said conveyor including, an intake position wherein said conveyor provides support for a loaf of cheese when it is located in said intake position, a vertical harp including spaced wires for cutting said loaf, and means for laterally moving said loaf from said rollers in a direction parallel to said longitudinal axis of said rollers through said harp thereby cutting the loaf wherein said laterally moving means includes a hydraulically actuated ram which is perpendicular to, and moves in a direction parallel to the longitudinal axis of said rollers, said ram having a scalloped lower portion so that when said ram is properly positioned the ram extends below the upper surface of said rollers and the bottom of the loaf, said ram being positioned so that a gap between said rollers and said scalloped portion of said ram is of a minimal magnitude, thereby providing maximum surface contact between the side of said loaf and said ram thus minimizing the likelyhood of impairment of the structural integrity of the loaf of cheese; and

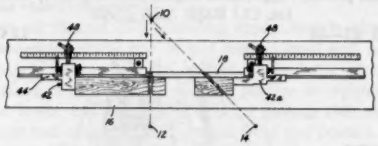
second means for receiving the loaf of cheese after it has been cut.

4,111,088

CUT-OFF GAUGE FOR SAW TABLES

Lynn J. Ziegelmeyer, 113 Cottage, #2A, P.O. Box 1112, Medford, Oreg. 97501

Filed Jun. 10, 1974, Ser. No. 477,604
Int. Cl.² B27B *27/06*
U.S. Cl. 83—471.2 **2 Claims**



1. A directly readable length indicating, sawing structure comprising the combination with a work supporting saw table and a saw adapted for travel over the table, of

(a) a metallic fence member fixedly secured to said table in non-conflicting relation to said saw and having a fixed upstanding work aligning face,

(b) a work length indicating scale affixed to the table and extending in the same direction as the work aligning face of the fence member,

(c) a work-piece stop adjustable along said fence member and including a work-piece-end-engaging face disposed at right angles to the work aligning face of the fence member,

(d) means for fixing the stop in any desired position along the fence member,

(e) a pointer mounted directly on the work-piece stop and cooperative with the scale,

(f) means for finely adjusting the pointer relative to the work-piece-end-engaging face of the work-piece stop on which the pointer is mounted, the construction and arrangement being such that the fine precision of cutting length indicated on the fixed scale by the pointer can be established and maintained for varying lengths throughout an available range of adjustment of the work-piece stop, and the pointer carried thereby, and

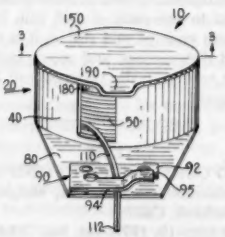
(g) the fence consisting of a plurality of like sections mounted end to end, the sections having alignable hollow portions of identical cross-section in which a block of appropriate shape may be fitted, and correspondingly located perforated ears at their extremities through which the sections may be clamped to one another.

4,111,089

REFILLABLE CUTTING DISPENSER

Elio Montaruli, Via Salaria 1302, 00138 Rome, Italy

Filed Dec. 9, 1976, Ser. No. 750,286
Int. Cl.² B26D *5/10*
U.S. Cl. 83—542 **8 Claims**



1. A refillable dispenser comprising

a cup-shaped member including a base, a cylindrical side wall having an opening therein, and a closure cap,

an extension of said base extending beyond said cylindrical wall, generally in alignment with said opening in said cylindrical side wall,

a central vertical post secured to said base inside said cup-shaped member,

a spool carrying a length of wire, or the like, rotatably mounted on said post within said cup-shaped member, the leading end of said wire extending out of said cup-shaped member from said spool through said opening in said side wall,

said closure cap being removably seated on the upper rim of said side wall and forming a tight fit therewith, and

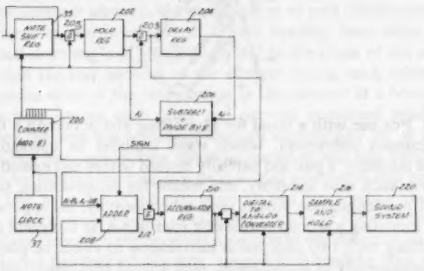
a cutting mechanism secured to the top surface of said extension of said base member and generally aligned with said opening in said side wall so that said wire can be fed directly thereto and a length can be cut therefrom, said cutter comprising a first plate and a second plate disposed on the top surface of said extension generally parallel to each other with a small space between them, said plates being disposed generally transverse to the path of said wire from said spool and out of said opening to said cutting mechanism,

said first plate being secured flat to the top surface of said extension and said second plate being generally rectangular and secured at one end to said top surface of said extension whereby said second plate can be moved up and down with respect to said first plate to cut said wire which is between them.

4,111,090
NOISE REDUCTION CIRCUIT FOR A DIGITAL TONE GENERATOR

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Oct. 18, 1976, Ser. No. 733,141
Int. Cl.² G10F *1/00*
U.S. Cl. 84—1.01 **4 Claims**



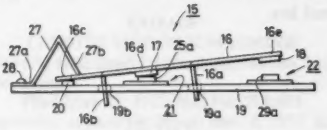
1. Apparatus for reducing audio noise in the musical output of a digital tone synthesizer wherein a musical tone is generated in response to a series of digital data words defining the amplitudes of a succession of equally spaced sample points on the audio signal of the tone being generated, by converting said data words to an analog voltage whose amplitude is controlled by said data and is changed in steps, comprising:

first and second register means for storing first and second ones of said data words, means transferring said series of data words successively from the first register means to the second register means at any predetermined rate, subtracting means coupled to the first and second register means including means for generating an output signal proportional to the difference in value of the digital words in the first and second register means, means for converting each data word in succession as transferred to the second register means to a voltage proportional in amplitude to the value of said data word, and integrating means responsive to the output signal from the subtracting means for changing said voltage between successive conversions of the data words at a rate determined by said signal from the subtracting means.

4,111,091
TOUCH RESPONSE SENSOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

Yasuhiro Hinago, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jan. 25, 1977, Ser. No. 762,559
Claims priority, application Japan, Jan. 30, 1976, 51-9356[U]; Apr. 19, 1976, 51-48948[U]; May 6, 1976, 51-56733[U]; May 6, 1976, 51-56734[U]
Int. Cl.² G10H *1/00*; G10C *3/12*
U.S. Cl. 84—1.01 **7 Claims**



1. A touch response sensor for an electronic musical instrument having a plurality of keys, comprising:

first and second switches located with a predetermined space therebetween on a base plate, each of said first and second switches including a resilient member made of elastomeric material with a movable contact on a lower surface thereof and at least one stationary contact located under said movable contact;

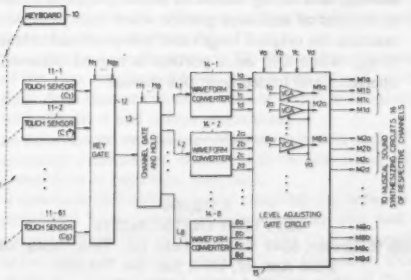
a common drive piece provided on said base plate to oppose an upper surface of said resilient member in each of said first and second switches and being rotatable on said base plate in accordance with depression of a key; and

a spring action on said drive piece to urge the drive piece to an initial position thereof where it is closer to said first switch than to said second switch, said first switch and said second switch being successively operated by said drive piece upon rotation of the drive piece against the force of said spring when the key is depressed.

4,111,092
ELECTRONIC MUSICAL INSTRUMENT

Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Feb. 28, 1977, Ser. No. 772,693
Claims priority, application Japan, Mar. 4, 1976, 51-25556[U]
Int. Cl.² G10H *1/02*
U.S. Cl. 84—1.27 **9 Claims**



1. An electronic musical instrument comprising:

(a) a keyboard including a plurality of keys, each key corresponding to a respective musical tone;

(b) means for detecting a characteristic of the finger touch

applied to each key upon depression thereof and producing a first signal corresponding to the depressed key;

(c) waveform converting means having only a single control input in use, said waveform converting means being coupled at said single control input to said detecting means and being responsive to said first signal for producing a plurality of second signals having respectively different waveforms;

(d) level adjusting means connected to said waveform converting means for receiving said second signals and adjusting their respective amplitudes to produce respective level-adjusted second signals; and

(e) means responsive to said level-adjusted second signals for individually controlling at least two of a plurality of musical tone elements which determine the tone pitch, color and volume of a musical tone corresponding to the depressed key.

4,111,093

STRING INSTRUMENT, IN PARTICULAR A GUITAR WITH FOLDABLE NECK PORTION

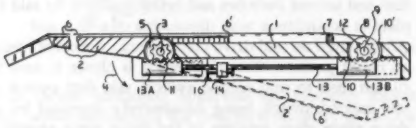
Roger Field, Cincinnati-Str. 41/B1, Munich 90, and Thomas Steger, Kaiser-Str. 34, Munich 40, both of Fed. Rep. of Germany (8000)

Filed Apr. 28, 1977, Ser. No. 792,076

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 7613617[U]

Int. Cl.² G10D *3/00, 1/08*

U.S. Cl. 84—267 **23 Claims**



1. A string instrument, such as a guitar, comprising:

an instrument body;

a neck portion, pivotably coupled to said body by means of a joint, to permit pivotal movement of said neck portion between an operative and a folded position;

a string mount moveably mounted on said body, at least one string one end portion of which is secured to said string mount and the other end portion of which is secured to said neck portion; and

drive means for moving said string mount, which is coupled to said string mount, and said joint, said drive means moving said string mount in direct response to pivotal movement of said neck portion about said joint, so as to maintain the original length and tension of said at least one string, when said neck portion is moved between said operative and folded positions thereof.

4,111,094

RHYTHM INSTRUMENT

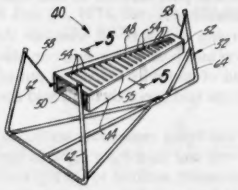
Philip R. Broser, 6349 Emerald Lake Dr., Troy, Mich. 48084

Filed Apr. 29, 1977, Ser. No. 792,309

Int. Cl.² G10D *13/02, 13/08*

U.S. Cl. 84—402 **9 Claims**

1. A rhythm instrument comprising; a body member comprising an elongated structure having walls converging from one end to the other of said body member, said body member forming a large end portion and a small end portion, said large end portion being open to the interior of said body member, a



flat playing surface formed at the top of said body member and adapted to be struck to produce a sound.

4,111,095

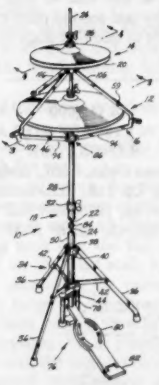
PERCUSSION INSTRUMENT MOUNTING APPARATUS

Steven R. Simons, 223 Golden Clr., Newport Beach, Calif. 92660

Filed Nov. 2, 1977, Ser. No. 847,731

Int. Cl.² G10D *13/00, 13/06*

U.S. Cl. 84—422 R **11 Claims**



1. For use with a stand for supporting and actuating a first percussion instrument, which stand includes an upstanding tube assembly, a pull rod partially housed within and extending above such tube assembly, and means for reciprocating such pull rod lengthwise within such tube assembly; an apparatus for mounting a second percussion instrument on the stand and enabling such two percussion instruments to either be played simultaneously or individually, such second percussion instrument support apparatus comprising:

(a) an extension rod which is detachably connectable to the pull rod to extend the length of the pull rod, a portion of the second percussion instrument being attachable to said extended pull rod; and

(b) means connectable to the stand for supporting another portion of the second percussion instrument both stationary in respect to the stand and at an elevation above the first percussion instrument.

4,111,096

FASTENING DEVICE

Ulf Kenneth Folke Fasth, Harplinge, Sweden, assignor to AB Fast-Devel, Harplinge, Sweden

Filed Apr. 17, 1975, Ser. No. 569,083

Claims priority, application Sweden, Apr. 25, 1974, 74056003

Int. Cl.² F16B *15/00*

U.S. Cl. 85—11 **4 Claims**

1. A fastening device for fastening a layer of pierceable material, in particular an insulation material, on a support

surface, comprising a single elongated and substantially thin strip of a relatively rigid but bendable material, said strip having a substantially constant width over its length and having at least one longitudinal reinforcement element extending over the length of the strip and imparting an increased rigidity against bending to the strip, a first relatively smaller portion of the strip adjacent one end thereof for being secured flush to said support surface, a first transverse bending line along which the strip has a reduced resistance to bending, said first transverse bending line being located between said first portion and the remaining portion of the strip, a second transverse bending line along which the strip has a reduced resistance to bending, said second transverse bending line being located along the strip between said first bending line and the opposite end of the strip spaced from said first bending line by a distance corresponding to the thickness of the layer to be fastened on the support surface, said first and second bending lines being comprised of interruptions in said longitudinal reinforcement element; a third transverse bending line along which the strip

has reduced resistance to bending and located between said second bending line and said opposite end of the strip and spaced from said second bending line, said third transverse bending line being comprised of additional interruptions in said reinforcement element, the end surfaces of said reinforcement element at said interruptions at said bending lines being inclined at an angle of substantially 45° to the plane of the strip so that the end surfaces of the element facing each other at opposite sides of the interruption in the element at a bending line bear against each other and prevent continued bending when the strip has been bent through substantially 90° at said bending line, self-locking retaining means at said first bending line for locking the strip in a light-angled position at said bending line, a portion of the strip adjacent said first bending line on the side thereof opposite to said first portion of the strip being slightly curved in the opposite direction to the direction of the intended bending of the strip at said first bending line, said opposite end of the strip being cut off at an angle to a sharp point.

4,111,097

ARMOR

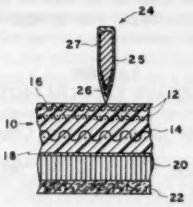
George Lasker, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Oct. 29, 1974, Ser. No. 518,688
Int. Cl.² F41H *5/04*
U.S. Cl. 89—36 A **5 Claims**

1. A laminated armor for protection against armor piercing projectiles comprising:

means including at least one steel wire mesh to separate the projectile core from the remainder of the projectile;

means including a tungsten wire mesh to fracture the projectile core; and



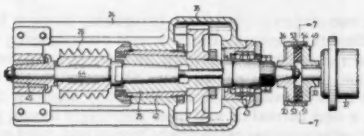
means to absorb the remaining energy of the fractured projectile core.

4,111,098

CARBIDE HOBBING MACHINE

Masato Ainoura, 1253 Eguchi, Kita-Shigeyasu-cho, Miyaki-gun, Saga-ken, Japan

Filed May 23, 1977, Ser. No. 799,679
Claims priority, application Japan, Mar. 8, 1977, 52-25133
Int. Cl.² B23F *5/22*
U.S. Cl. 90—4 **3 Claims**



1. A carbide hobbing machine comprising:

(a) a tool support member (**24**) operably mounted on a machine frame and including a hob support shaft (**25**) for supporting a carbide hob (**26**);

(b) a work piece support member (**28**) operably mounted on the machine frame to support a work piece (**31**);

(c) a hydraulic motor (**32**) mounted on the tool support member adjacent to the carbide hob and including a motor shaft (**33**) extending on the same axial line as that of the hob support shaft;

(d) a coupling (**34**) disposed between the motor shaft (**33**) and the hob support shaft (**25**) to directly drive the carbide hob (**26**) and to absorb shocks and vibrations imposed on the carbide hob during the operation of hobbing the work piece, said coupling including:

(e) a drive coupling disk (**49**) fixed to the motor shaft and having a plurality of drive projections (**49*a***) on its side face;

(f) a driven coupling disk (**50**) fixed to the hob support shaft and having a plurality of driven projections (**50*a***) on its side face so that the drive projections and driven projections are arranged alternately;

(g) a cylindrical coupling cover (**51**) disposed on the outside of the two coupling disks to form a plurality of substantially delta-shaped container chambers (**52**) in cooperation with the drive and driven projections;

(h) a delta-shaped resilient member contained in each of the container chambers in contact with the drive and driven projections at both side faces; and,

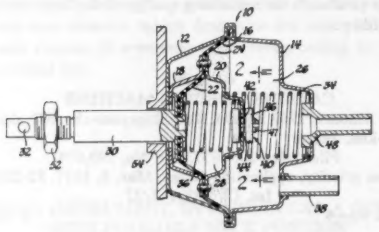
(i) a clearance (**54**) defined in said coupling (**34**) between the peripheral face of each resilient member (**53**) and the coupling cover (**51**) sized to permit the resilient members to be elastically deformed outwardly so as to allow torsion of the hob support shaft when a cutting edge of the hob bites at the work piece and for preventing the deformation of resilient members beyond a certain level so as to impede the torsion of the hob support shaft with advance of the hobbing operation, whereby the resilient member is

slowly restored to the original state while leaving a residual strain sufficient to gradually eliminate the torsion on the hob support shaft at the time of completion of the hobbing operation by the cutting edge of the hob.

4,111,099
TWO-STAGE VACUUM MOTOR

Earl R. Fischer, Rochester, and John A. Gural, Pittsford, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 8, 1977, Ser. No. 785,779
Int. Cl.[2] F15B *11/18*; F01B *7/20*
U.S. Cl. 91—173 **2 Claims**

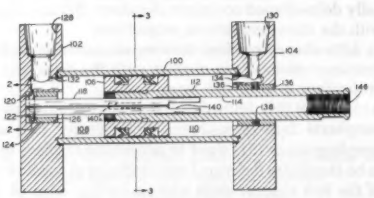


1. A two-stage vacuum motor comprising an outer housing, outer diaphragm means secured to said outer housing to form a primary chamber therebetween, an inner housing carried by said outer diaphragm means, inner diaphragm means secured to said inner housing to form a secondary chamber therebetween, a stem carried by said inner diaphragm means, primary and secondary springs respectively biasing said outer and inner diaphragm means away from said outer and inner housings, said inner housing having an opening from said secondary chamber to said primary chamber, and a valve biased to obstruct said opening and having an extension projecting toward said outer housing, said outer housing having a primary fitting for applying a vacuum signal to said primary chamber effective to retract said outer diaphragm means together with said inner housing and said stem against the bias of said primary spring, thereby engaging said valve extension with said outer housing to displace said valve from said opening, said outer housing having a secondary fitting which registers with said opening when said valve extension is engaged with said outer housing for applying a vacuum signal to said secondary chamber effective to further retract said inner diaphragm means and said stem against the bias of said secondary spring.

4,111,100
NON-ROTATABLE FLUID POWERED NOZZLE AND VALVE COMBINATION

Peter W. Boyer, Fort Wayne, Ind., assignor to PHD, Inc., Fort Wayne, Ind.

Filed Mar. 7, 1977, Ser. No. 774,774
Int. Cl.[2] F15B *15/22*; F01B *19/00*
U.S. Cl. 91—401 **5 Claims**

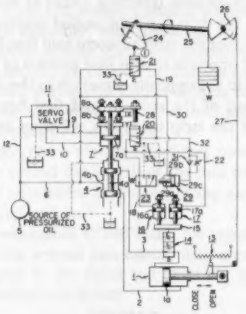


1. A non-rotatable fluid powered nozzle and valve combination comprising a cylinder having a piston reciprocally received therein for movement between two reciprocated positions and which define two separated fluid chambers therewith, a piston rod secured to said piston slidably received through one end of said cylinder, two ports in said cylinder communicating with said two chambers, respectively, said piston and piston rod conjointly having a longitudinally extending passage therethrough, a valve pin in one of said chambers slidably received in sealing relation by a portion of said passage, means mounting said valve pin in the other end of said cylinder for limited radial and tilting movement with respect to said cylinder, said mounting means including a retaining element secured to one end of said pin to project radially therefrom and disposed in a recess which is fixed relative to said cylinder, said recess having a clearance with respect to said element radially of said cylinder, whereby said valve pin is self-aligning with respect to the receiving portion of said passage, valve means including said valve pin interposed between said one chamber and said passage which for one reciprocated position of said piston in said cylinder severs communication between said one chamber and said passage and for a second reciprocated position opens communication therebetween, whereby pressure fluid admitted to said one chamber acts against said piston when the latter is in said first position and flows through said passage when said piston is in said second position, said valve pin and said passage portion in cross-section being complementary and other than circular whereby said piston and piston rod are held against rotation relative to said valve pin; said valve means including an opening in the end portion of said valve pin received by said passage, said opening providing communication between said one chamber and said passage when said piston is in its second position while said valve pin remains engaged with said passage portion, said opening being closed from said one chamber when said piston is in its first position.

4,111,101
APPARATUS FOR CLOSING GUIDE VANES OF A HYDRAULIC MACHINE

Yasuaki Obiya, Kawasaki, and Saburoo Ikeda, Sagamihara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 25, 1977, Ser. No. 781,427
Claims priority, application Japan, Mar. 29, 1976, 51-34997
Int. Cl.[2] F15B *15/22*
U.S. Cl. 91—405 **6 Claims**



1. Apparatus for closing guide vanes of a hydraulic machine comprising

a servo-motor for operating the guide vanes,

a distributing valve responsive to the variation in the speed of said hydraulic machine for supplying and discharging operating fluid to and from said servo-motor,

a throttle transfer valve for stepwisely varying the flow of the operating fluid discharged from said servo-motor thereby stepwisely varying the closing speed of said guide

vanes successively through first, second and third closing speeds,

a first fluid actuator for operating said throttle transfer valve to a position for setting said second closing speed.

a second fluid actuator for operating said throttle transfer valve to a position for setting said third closing speed,

conduit means for supplying operating fluid to said first and second fluid actuators from a source of operating fluid,

a first transfer valve for selectively connecting said conduit means to said source,

means responsive to the closing operation of said servo-motor for switching said first transfer valve to an operating position for connecting said conduit means to said source when said servo-motor moves over a first closing stroke,

a second transfer valve connected in series with a conduit for supplying and discharging said operating fluid to and from said first fluid actuator, and

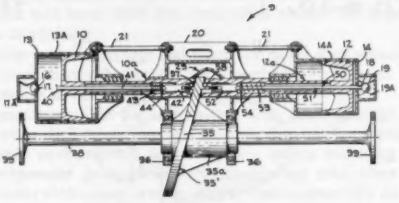
a time delay means connected to said second transfer valve for discharging the operating fluid from said first fluid actuator when said servo-motor completes a second closing stroke,

thereby stepwisely closing said guide vanes at different closing speeds.

4,111,102
STEAM ENGINE IN WHICH THE CYLINDER INLET VALVES ARE ACTUATED BY THE OPERATION OF THE POWER CONVERSION MEANS

Marion K. Harris, P.O. Box 1591, Atascadero, Calif. 93422

Filed Feb. 4, 1977, Ser. No. 765,676
Int. Cl.² F01B *3/10*
U.S. Cl. 91—480 **10 Claims**



1. A steam engine comprising:

(a) a source of steam under pressure;

(b) a first cylinder forming a first chamber and formed with an inlet port communicating with said first chamber and an exhaust port communicating with said first chamber;

(c) a first inlet valve communicating with said source of steam and said first chamber through said inlet port for controlling the flow of steam in said first chamber;

(d) a first piston disposed within said first chamber of said first cylinder, said first piston being reciprocated within said first chamber of said first cylinder by the flow of steam in said first chamber;

(e) power conversion means operatively responsive to the reciprocating movement of said first piston for converting the rectilinear movement of said first piston to a rotary motion, said power conversion means comprising a swash plate rotated by the reciprocating movement of said first piston; and

(f) first valve-actuating means operatively responsive to the movement of said power conversion means and arranged to engage said first inlet valve for controlling the opening and closing of said first inlet valve,

(g) said swash plate having a first cam mounted thereon, said first valve actuating means being arranged to engage said first cam to be actuated thereby for controlling the opening and closing of said first inlet valve,

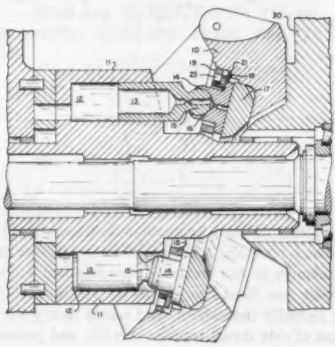
(h) said first valve-actuating means comprising a first push rod slidably journalled for movement parallel to the path of travel of said first piston, said first push rod at one end portion thereof having a first cam follower for engaging said first cam and at another end portion thereof said first push rod being adapted to engage said first inlet valve for controlling the opening and closing of said first inlet valve in response to the rotation of said swash plate,

(i) said first piston being formed with a first tubular extension extending toward said swash plate and said first push rod being disposed in said first tubular extension of said first piston, whereby said first push rod moves with said first piston during a portion of its reciprocating movement and said first push rod moves relative to said first piston under the urgency of said first cam of said swash plate to actuate said first inlet valve.

4,111,103
THRUST RINGS FOR SWASH PLATE PUMPS AND MOTORS

David L. Mauch, Bordman, Ohio, assignor to Commercial Shearing, Inc., Youngstown, Ohio

Filed Feb. 14, 1977, Ser. No. 768,393
Int. Cl.² F01B *13/04*
U.S. Cl. 92—57 **5 Claims**



1. In a swash plate pump or motor having a swash plate, a cylinder block and cylinders rotating relatively to said swash plate, pistons in said cylinders moving generally transversely to the swash plate, drive slippers operatively connected to said pistons and a slipper plate fixed to the swash plate against which the slippers bear, the improvement comprising a swivel plate having spaced openings for said slippers on the opposite side of said slippers from the slipper plate, a positive hold down ring connected to the swash plate and bearing on said swivel plate to maintain it at a fixed distance from the slipper plate whereby a fixed running clearance is maintained between the slipper and the slipper plate, said hold down ring having a series of successive controlled wedge angles on the face of the hold down ring adjacent the swivel plate and having oil feed means through the hold down ring and connected to each wedge angle whereby to create a hydrodynamic force holding the swivel plate and hold down ring apart.

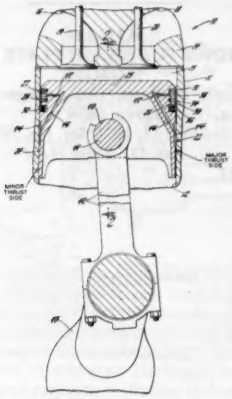
4,111,104
ENGINE WITH LOW FRICTION PISTON

Ellard D. Davison, Jr., Grosse Pointe Farms, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 30, 1977, Ser. No. 783,052
Int. Cl.² F01B *31/00*
U.S. Cl. 92—127 **8 Claims**

1. An engine having at least one cylinder closed at one end and having means for admitting working fluid to and discharging working fluid from the closed end, a piston having a side wall and a closed end with a pair of axially spaced peripheral ring grooves between the closed end and the side wall, said piston being reciprocably received in the cylinder with the

closed ends of the piston and cylinder opposing one another to define a variable volume working chamber in which a working fluid may be pressurized, said piston being connected with an output shaft through means converting a portion of the working gas pressures into side thrust forces, the piston side wall being in closely spaced relation to and slidingly engagable with the cylinder to transfer the side thrust forces thereto, a first compression piston ring in the ring groove closest the piston closed end and a second compression piston ring in the other ring groove, said rings engaging the cylinder to imperfectly seal the working chamber and limit leakage of the working fluid toward the piston skirt, said piston rings, piston and



cylinder together defining an annular clearance space between the rings which normally contains fluid at a pressure intermediate the pressures in the working chamber and at the piston skirt, at least one fluid bearing recess in the side wall and extending partially thereabout, said recess facing the cylinder at a portion of side thrust transfer thereto, and passage means in the piston passing inwardly of the second piston ring and exclusively communicating the annular clearance space with the bearing recess whereby pressurized fluid is conducted from the clearance space to the recess to provide a separating force tending to offset the thrust loads acting between the piston and cylinder, thus reducing sliding friction at the piston-cylinder interface.

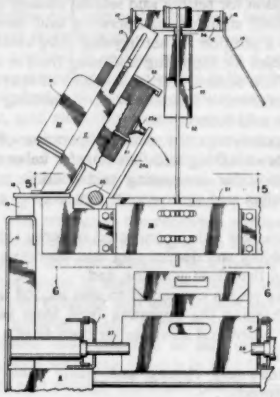
4,111,105

MACHINE AND METHOD FOR PLACING AN INSERT INTO AN ARTICLE CARRIER CELL

Will Lester Culpepper, Tucker, and Jack Seabron Cooley, Atlanta, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 28, 1977, Ser. No. 791,790
Int. Cl.[2] B31B *1/44*
U.S. Cl. 93—37 SP **11 Claims**

1. A machine for placing an insert into an article carrier cell, said insert being constructed of semirigid sheet material and comprising a main panel and a bottom panel foldably joined by a fold line to said main panel and being substantially coplanar when in blank form, said machine comprising a frame, a vertically reciprocable insertion blade mounted on said frame and engageable with said insert in general proximity to said fold line between said main panel and said bottom panel and operable in conjunction with a pair of fixed folding elements mounted in said frame to fold both said bottom panel and said main panel upwardly from said fold line and toward each other and simultaneously to lower said insert into said cell, and the lower edge of said insertion blade being approximately the same length as said fold line between said main panel and said



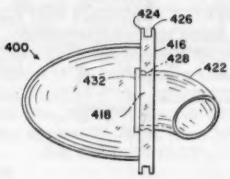
bottom panel and being substantially coincidental therewith during folding and lowering of said insert.

4,111,106

AUTOMOBILE VENTILATION SYSTEM

William M. Burns, 10306A Malcolm Cir., Cockeysville, Md. 21030

Filed Apr. 18, 1977, Ser. No. 788,354
Int. Cl.[2] B60J *1/20*
U.S. Cl. 98—2.13 **7 Claims**

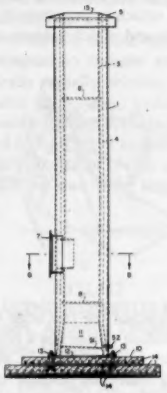


1. In an automobile ventilation system having a plate for installation and retention in the space above an automobile roll-up window and a seal thereabove, and venting means in said plate, the plate having upper and lower and front and rear edges and an outer face and an inner face relative to said an automobile when installed therein, the improvement comprising: the plate having an aperture centrally in the plate, an air scoop fixed in forward direction on the outer face at the aperture, a duct at the inner face having communication with the air scoop through the aperture for receiving air flow from the air scoop and expelling same in an automobile interior, duct orienting means on the plate and having intake in fixed alignment with the air scoop, for adjustably ducting the air in a selected direction in an automobile interior, means for sliding the plate in a forward and rearward direction including the plate having a length proportionally short relative to said a space above an automobile window for varying air flow expelled through the duct, means adapting the automobile ventiliation system for installation on either the left side or the right side of said an automobile, including: said forward and rearward edges of the plate being substantially upright, the lower edge of the plate and the upper edge of the plate being generally parallel and having each a double flange structure projecting therefrom, and the spacing between the flanges of each double flange structure being proportioned for receiving and retaining the edge of said an automobile roll-up window therebetween.

4,111,107
DOUBLE WALLED SMOKESTACK APPARATUS

Donald J. Engleke, 31 Hewlett Rd., Towaco, N.J. 07082

Filed Jan. 27, 1977, Ser. No. 762,993
Int. Cl.[2] F23L *17/02*
U.S. Cl. 98—60 26 Claims



1. In double-walled smokestack apparatus including inner shell means for receiving flue gases to be vented to the environment, outer shell means disposed about said inner shell means, said outer shell means having a cross-sectional extent which exceeds the cross-sectional extent of said inner shell to form a gap therebetween and insulating means disposed intermediate said inner shell and outer shell means, the improvement comprising:

means interconnecting said inner and outer shell means at a location of substantially zero moment of said inner shell means to base mounting structure;

breeching means for introducing flue gases through said outer shell means into said inner shell means for venting to said inner shell means, said breeching means including first expansion joint means interconnecting said inner and outer shell means in such manner that substantially no load transference occurs therebetween; and

top cap means interconnecting said inner and outer shell means at the top of said smokestack apparatus, said top cap means including second expansion joint means permitting displacement between said inner and outer shell means with substantially no load transfer taking place therebetween, said inner and outer shell means each being independent load bearing members having substantially no load transfer taking place therebetween.

4,111,108
PERCOLATOR

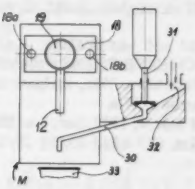
Louis Moser, 10, Le Seut, 2735 Malleray, Switzerland

Filed Apr. 11, 1977, Ser. No. 786,399
Claims priority, application Switze.land, Apr. 13, 1976, 4657/76; Mar. 17, 1977, 3322/77; Mar. 17, 1977, 3323/77
Int. Cl.[2] A47J *31/30*
U.S. Cl. 99—289 R 8 Claims

1. A percolator, comprising;

a unitary cylinder, having, axially aligned and mutually spaced, a pair of coffee compressing pistons normally positioned in the cylinder to jointly define a chamber for coffee grounds, the pair comprising a filter piston which has and supports a coffee filter, and a grounds discharging piston for ultimately discharging the coffee grounds from the chamber;

hydraulic drive pistons disposed in the unitary cylinder, one for each coffee compressing piston, for driving those pistons separately to vary their spacing and position so as to first receive loose coffee grounds therebetween and thereafter to compress them; and

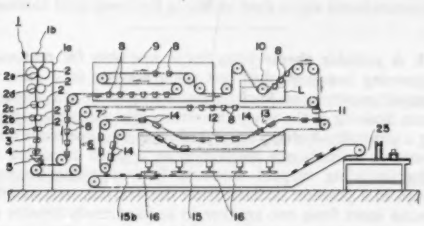


means defining an open end of the cylinder adjacent the filter piston and for entirely removing that piston and the compressed coffee grounds from the cylinder.

4,111,109
WHEAT FLOUR PRODUCT MANUFACTURING EQUIPMENT

Hatuo Sakurazawa, 15 banchi, Sinozuka, Fujioka-shi, Gumna-ken, Japan

Filed Aug. 19, 1976, Ser. No. 715,684
Claims priority, application Japan, Aug. 21, 1975, 50-115729[U]
Int. Cl.[2] A23L *3/00*; A47J *37/12*
U.S. Cl. 99—353 6 Claims



1. A wheat flour product manufacturing equipment comprising, in combination:

(a) a vertical rolling apparatus comprising a plurality of sets of vertically arranged rolling rollers, each of the sets having a rolling clearance between the rollers thereof, the rolling rollers of any one set having the rolling clearance thereof offset in the horizontal direction from the rolling clearance of the set of rolling rollers immediately thereabove.

(b) a gelatinizing apparatus,

(c) a seasoning apparatus,

(d) a frying apparatus,

(e) a cooling apparatus,

(f) a first endless conveyor having a plurality of trunnion-mounted buckets disposed thereon, the first conveyor transported product received from the rolling apparatus to the gelatinizing apparatus and the seasoning apparatus,

(g) a second endless conveyor for transporting product from the seasoning apparatus to the frying apparatus, the second endless conveyor having buckets affixed thereonto in which product is received from the first conveyor, each bucket having a lid,

(h) means for opening each lid as it receives product from the buckets of the first conveyor, the means closing the lids as the buckets travel through the frying apparatus and means for re-opening the lids as the buckets approach the cooling apparatus, the means for opening and closing the lids being located adjacent the path of the second conveyor so as to be contacted by means carried on the lids,

(i) a third endless conveyor for receiving the product from the opened bucket for transporting product from the frying apparatus to the cooling apparatus, and

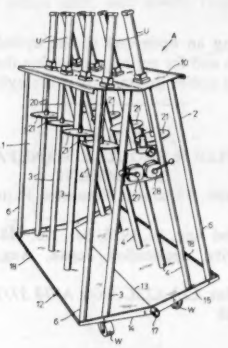
wherein the gelatinizing apparatus and seasoning apparatus are elevated above the frying apparatus and the cooling apparatus is disposed below the frying apparatus.

4,111,110

PORTABLE CHEESE PRESS FRAME ASSEMBLY

Gary R. Smith, Watertown, Wis., assignor to Kusel Equipment Company, Watertown, Wis.

Filed Jun. 6, 1977, Ser. No. 803,793
Int. Cl.[2] A01J *25/10, 25/15*
U.S. Cl. 99—456 **4 Claims**



1. A portable cheese press frame assembly for removably supporting hoops stacked one upon another in a generally vertical position and for pressing the curd in said hoops to cause draining of the whey therefrom, said assembly comprising a generally A-shape frame including opposite sides which converge towards one another in an upward direction, said sides including support members for supporting stacks of hoops in a position inclined from the vertical, said members spaced apart from one another so as to securely receive said hoops in stacked relationship and for supporting them during a curd pressing operation, cylinder and piston units mounted on the top of said frame and including an extensible piston member extending downwardly for pressing the curds in said hoop, control means carried by said assembly for actuating said cylinder and piston units in extending and contracting directions, said assembly also including a pan-like floor at the bottom thereof and having a drain, said floor being inclined towards said drain so as to receive whey drained from said hoops, whereby as said cylinder and piston units are extended to press the curd located in said generally vertically stacked hoops, the whey from said hoops drains downwardly and onto said floor and out said drain.

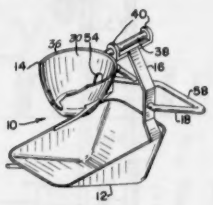
4,111,111

SEPARATING MECHANISM FOR EGG BREAKING MACHINE

Charles H. Willsey, Rte. 1, Maple Hill, Kans. 66507

Filed Aug. 4, 1975, Ser. No. 601,655
Int. Cl.[2] A23J *1/09*
U.S. Cl. 99—499 **4 Claims**

1. In a machine for breaking shell eggs and separating the contents of each egg, a separating assembly adapted to the positioned to receive the contents of an egg which is discharged in flowable condition from a breaking and dumping mechanism, said separating assembly comprising an albumen collecting means in the form of a pan and a member for initially receiving the egg contents and for separating the albumen from the yolk which is disposed vertically above said collecting means and which is in the form of an upwardly opening, bowl-shaped container having an upper edge which is generally circular and of a diameter sufficient to receive the contents of an egg from a breaking mechanism disposed vertically above the same, said bowl shaped container having side wall portions depending from said upper edge and tapering inwardly to an imperforate bottom portion which is formed of a size and shape to support the natural configuration of the yolk sac, means at one side of said bowl shaped container supporting said container in upwardly opening, generally horizontal position for receiving the whole egg contents, said side wall portions having a slot formation which is peripherally spaced relative to said supporting means and which extends upwardly in a vertical direction from adjacent the top edge of said bottom portion, which slot formation comprises a realtively narrow bottom portion extending a short distance above said container bottom portion and a wider top portion which enables a relatively large mass of albumen to pass as a unit through said verticaliy extending slot into said albumen collecting means while said container remains in generally horizontal contents receiving position and while the yolk remains supported in said bottom portion thereby enabling the albumen to be separated from the yolk.

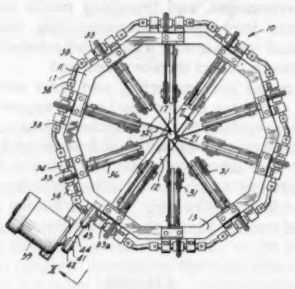


4,111,112

FRUIT SECTIONIZING MACHINE

James E. Altman, Box 334, Gray, Ga. 31032

Filed Apr. 22, 1976, Ser. No. 679,381
Int. Cl.[2] A23N *4/00*
U.S. Cl. 99—538 **18 Claims**



1. Apparatus adapted for sectioning cored fruit comprising supporting frame means,

an upstanding stationary spindle associated in a base region thereof with said frame means having an axis and having a plurality of longitudinally extending, circumferentially spaced slot means defined therein, the maximum diameter of said spindle being less than the diameter of the core cavity in such cored fruit,

a plurality of rotatable circular blade means, each said blade means having an axis and including an associated axially located stub shaft means and journal means,

individual blade means of said plurality being positioned in circumferentially spaced relationship to one another by said frame means about said spindle axis, each said blade means axis having generally the same angular relationship to radii from said spindle axis, the peripheral edge of each

said blade means being in spaced, proximate relationship to a different one of said slot means,

a power head,

a shaft system rotatably drivable by said powerhead, including journal means supporting same by said frame means, said shaft system operatively extending circumferentially about said peripheral blade means edges in radially spaced relationship thereto, and

a plurality of power transfer means, each said power transfer means being adapted to transfer rotational power in a direction generally radially relative to said shaft system from said drivable shaft system to each one of said blade means for rotatably driving said blade means,

whereby such cored fruit in being sectioned passes along said spindle through said plurality of blades without radial expansion forces acting thereon due to the shape of said spindle.

4,111,113

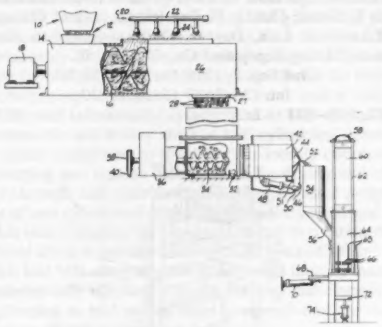
PACKAGING ASBESTOS FIBERS

Gerard Lucien Lambert, Asbestos, Canada, assignor to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 438,969, Feb. 4, 1974. This application Sep. 17, 1976, Ser. No. 722,454

Int. Cl.² B30B *15/30*

U.S. Cl. 100—74 **5 Claims**



1. Apparatus for producing an asbestos block having a density of at least 90 PCF, said apparatus comprising:

(a) mixing means for completely containing and mixing loose asbestos fibers and a small amount of liquid to produce a mixture in which the liquid is evenly distributed throughout the asbestos fiber and is present as no more than 8% by weight of fiber, said mixing means also preliminarily consolidating said mixture, and said mixing means also containing means for discharging the preliminarily consolidated mixture into consolidating means;

(b) consolidating means disposed to receive said mixture discharged from said mixing means, said consolidating means further consolidating said mixture into an intermediately compacted body, said consolidating means including an extrusion device and a restrictive orifice, said consolidating means also containing means for discharging said intermediately compacted body into a press; and

(c) a press disposed to receive said intermediately compacted body discharged from said consolidating means and including a mold chamber, said mold chamber having means for venting air from within said chamber during a compression stroke of said press, said press being capable of exerting sufficient compressive force on said intermediately compacted body to form said asbestos block of at least 90 PCF density.

4,111,114

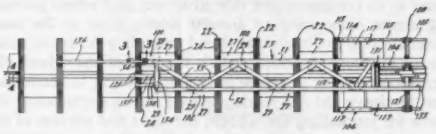
MACHINE FOR APPLYING NAIL PLATES FOR TRUSS ASSEMBLY

Ronald R. Carr, Detroit, Mich., assignor to The Panel Clip Co., Farmington, Mich.

Filed Mar. 28, 1977, Ser. No. 782,070

Int. Cl.² B30B *7/00*

U.S. Cl. 100—100 **15 Claims**



1. In a machine for fastening members of a truss in firm fixed relation with each other, a table having a central and opposite end portions on which the members of the truss are assembled with their ends in abutted relation, a carriage movable along the entire length of said table, means on said central table portion which is adjustable toward and away from the transverse center of the table along with the opposite end portions which move as units, and means on said carriage at opposite longitudinal edges of said table which are vertically movable toward and away from each other for forcing the nails of nail plates into the bottom and top of the abutted portions of the assembled truss members at one or both edges simultaneously.

4,111,115

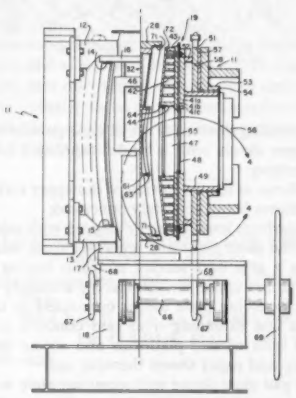
CONTINUOUS FILTER PRESS

Charles E. Cory, Sebastopol, Calif., assignor to Bepex Corporation, Santa Rosa, Calif.

Filed May 23, 1977, Ser. No. 799,453

Int. Cl.² B30B *9/06, 3/04*

U.S. Cl. 100—116 **7 Claims**



1. In a continuous press for extracting liquid from liquid containing feed materials, a main machine frame, a pair of rigid side structures, means serving pivotally to carry corresponding end portions of the structures on the frame, a pair of opposed wheels disposed between the side structures, each wheel having a central annular opening and including a conical shaped screen mounted on the inner face of the same and a main annular wheels structure, means for journalling each wheel to its corresponding side structure, means for yieldably urging the side structures and wheels toward each other, the axes of the wheels during operation being out of alignment whereby when the wheels are rotated portions of the screens are brought into proximity in a pinch zone and other portions of the screens are

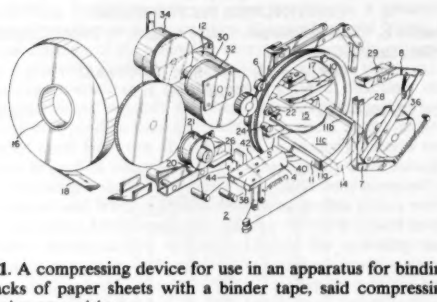
separated to form a feed receiving space, casing means carried by the frame and surrounding the space between the screens of the wheels, the casing means having an inlet opening for receiving feed material and a discharge opening spaced from the inlet opening for discharging material, a rigid plow having one outer end portion secured to the casing between said openings, the other inner and end portion of the plow being disposed in the central region of the casing and between the central regions of the wheels, the plow serving to divert material through the discharge opening, means for journalling each wheel to its corresponding side structure, said wheel journalling means comprising an annular sleeve fixed to the main wheel structure of each wheel and extending from the outer side of the same concentric with the axis of the wheel, the corresponding side structure having an opening to accommodate the sleeve and also having bearing means surrounding the sleeve for journalling the wheels, the inner end portion of the plow being formed to have annular interfitting relationship with the central openings of the wheels, said central openings being accessible through the sleeves.

4,111,116

APPARATUS FOR CLAMPING AND BINDING A STACK OF PAPER

Yukio Ito, Fujisawa, and Susumu Morishima, Kamakura, both of Japan, assignors to Hitachi Denshi Engineering Kabushiki Kaisha and Musashi Kabushiki Kaisha, Tokyo, both of Japan

Filed Apr. 20, 1977, Ser. No. 789,280
Claims priority, application Japan, Apr. 27, 1976, 51-47211
Int. Cl.[2] B30B *15/06*
U.S. Cl. 100—281 **5 Claims**



1. A compressing device for use in an apparatus for binding stacks of paper sheets with a binder tape, said compressing device comprising:

a first platform, at least a portion of the upper surface of said first platform being arcuately concaved;

a second platform longitudinally aligned with said first platform in the same plane and separated from said first platform by a gap, said second platform having at least a portion of the upper surface thereof arcuately concaved;

a resilient receiving plate means connected to said second platform and extending over said concave surface portions of both of said platforms and across said gap for receiving said paper sheets thereon; and

a pressure pad plate above said receiving plate means reciprocally movable toward and away from said receiving plate means, said pressure pad plate having a lower surface which is arcuately convexed.

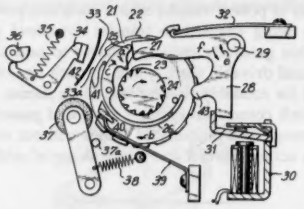
4,111,117

SELECTING MECHANISM FOR PRINTING TYPE RINGS

Chikao Tezuka, and Hitoshi Mikoshiba, both of 80, Oazahirookaharashinden, Shiojiri-shi, Nagano-ken, Japan

Filed Jul. 18, 1977, Ser. No. 816,770
Claims priority, application Japan, Jul. 16, 1976, 51-84766
Int. Cl.[2] B41J *1/48*
U.S. Cl. 101—93.28 **7 Claims**

1. A printing device, comprising a plurality of printing type rings having type face characters on the peripheries thereof, a rotatable printing type ring shaft having grooves on the periphery thereof, said printing type ring shaft supporting said printing type rings, a pawl member provided on each of said printing type rings, said pawl member being biased by biasing means to engage with said grooves of said printing type ring shaft, a plurality of selecting means for selectively bringing a corresponding pawl member into and out of engagement with



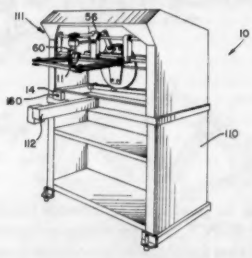
a selected groove of said printing type ring shaft and thereby causing a corresponding ring to rotate, and printing means for carrying out printing in cooperation with said printing type rings on a print-receiving member when placed therebetween, each of said printing-type rings rotating with said shaft only when the corresponding selecting means effects engagement of the pawl member with a selected groove of the rotating shaft.

4,111,118

MULTI-PURPOSE SCREEN PRINTING MACHINE

Melvin E. Green; Charles H. Derrickson, both of Chicago, Ill., and Louis A. Lala, Dayton, Ohio, assignors to American Screen Printing Equipment Co., Chicago, Ill.

Filed Sep. 7, 1976, Ser. No. 720,763
Int. Cl.[2] B41F *15/26, 15/30*
U.S. Cl. 101—123 **12 Claims**



1. A screen printing machine comprising a pair of spaced end supports, a first shaft connecting said end supports for pivotal movement relative to said end supports, arms mounted on opposite ends of said first shaft, a second shaft attached to each of said arms for limited pivotal movement thereabout, a third shaft mounted in parallel relationship to said second shaft and connected to said second shaft by a vertical linkage, said vertical linkage being laterally movable on said second and third shafts, a guide path formed in each of said end supports, each of said guide paths comprising a substantially vertically disposed slot, opposite ends of said third shaft having an extension immovable outside the axis of said third shaft, said extension captivated for movement in said guide path, said guide path restricting the travel of said third shaft for substantially vertical movement of said vertical linkage, means for supporting a screen mounted on said vertical linkage for substantially vertical movement of said screen, means for supporting a squeegee mounted on said second and third shafts for lateral movement relative to said vertical linkage, drive means on said first shaft mounted for lateral movement along said first shaft, means on said drive means for selective alternative connection to one of said means for supporting said squeegee and said means for

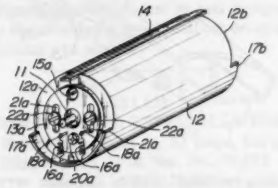
supporting a screen to permit printing of either curvilinear objects or flat objects, and a guide means for the stabilization of said screen and squeegee in a level position during the operation of said printing machine.

4,111,119

RECORD SHEET CLAMPING MECHANISM FOR DRUM TYPE FACSIMILE AND THE LIKE

Tatsuo Takizawa, Sagamihara, and Masachika Ikeda, Mitaka, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1977, Ser. No. 783,017
Claims priority, application Japan, Apr. 5, 1976, 51/40868[U]
Int. Cl.² B41F *27/06, 15/38;* B41L *29/14*
U.S. Cl. 101—127.1 **4 Claims**



1. An improved record sheet clamping mechanism for a drum type facsimile and the like, employing a hollow cylindrical drum secured to a rotary shaft for winding a record sheet therearound; a clamping bar extending along the outer peripheral surface of the cylindrical drum in an axial direction thereof and detachably holding one end of said record sheet on the outer peripheral surface of said cylindrical drum; the improvement comprising: a balancing member coextensive with and being disposed substantially symmetrical to said clamping bar with respect to said rotary shaft of said cylindrical drum, and being rigidly connected to slidable discs loosely connected to said clamping bar; tension spring means for urging said clamping bar through said slidable disc against an outer peripheral surface of said cylindrical drum, whereby the centrifugal force to which said clamping bar is subjected due to rotation of said cylindrical drum is substantially equal to the centrifugal force to which said balancing member is subjected thereby maintaining a substantially constant pressing force of said clamping bar for application to said record sheet irrespective of the number of rotations of said cylindrical drum.

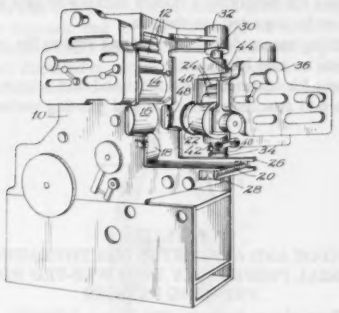
4,111,120

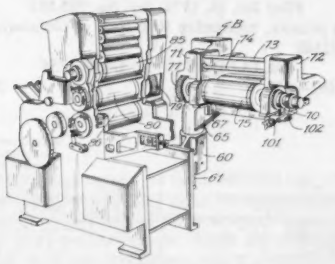
TWO COLOR SWING-AWAY PRESS

Harold E. Paulson, 5369 Vernon Lake Dr., Dunwoody, Ga. 30338

Continuation-in-part of Ser. No. 731,711, Oct. 12, 1976, abandoned. This application Jun. 20, 1977, Ser. No. 808,058
Int. Cl.² B41F *5/02, 13/12, 13/44*
U.S. Cl. 101—175 **7 Claims**

1. A printing press for printing multiple color designs comprising in combination: a base; a fixed frame on said base adapted to carry an ink supply system, a plate cylinder support shaft with a plate cylinder thereon, a blanket cylinder support shaft with a blanket cylinder thereon, an impression cylinder, and a drive system therefor; a vertical pivot axis support on said base adapted to carry a moving frame in pivoting relation about said pivot support, said moving frame adapted to carry an ink supply roller system and a second plate cylinder support shaft with a second plate cylinder thereon with the rotational axes of the ink supply roller system and second plate cylinder perpendicular to said vertical pivot axis so that the second plate cylinder can be pivoted into contact with said blanket cylinder so as to permit multiple color printing; a first gear on the end of the blanket cylinder support shaft closest to the pivot support; a second gear on the end of the second plate cylinder support shaft closest to the pivot support in position to engage said first gear when the second plate cylinder is pivoted into contact with the blanket cylinder; and rotational gear tooth position indicating means connected to the ends of the plate cylinder support shafts at the ends furthest from the pivot support to allow prealignment of the teeth on the first and second gears before engagement said rotational position indicating means comprising an index mark on the cylinder support structure and at least one disc mounted on a plate cylinder support shaft, said disc having wrench holes therein to permit the disc and cylinder to be rotated and a series of graduated marks about the periphery of the disc corresponding to the position of the gear teeth.



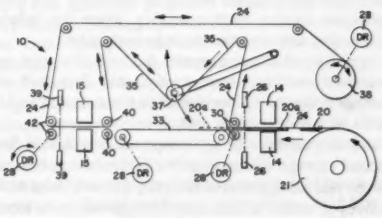


4,111,121

MULTI-IMPRESSION PRINTER FOR PRESSURE SENSITIVE LABELS

Charles Jerry Borum, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jun. 7, 1976, Ser. No. 693,789
Int. Cl.² B41F *13/56*
U.S. Cl. 101—227 **27 Claims**



1. A printer for discrete or continuous label stock having a

pressure sensitive adhesive protected by a release web, comprising:

(a) means for detaching a label from the label stock and the release web,

(b) means forming an attaching station for receiving said label from said detaching means and temporarily attaching the adhesive side of said label to a release backing,

(c) means for supplying a release backing to said attaching station for repeated use thereat,

(d) printing means defining a printing station for printing a pattern on said label, and

(e) means for advancing said label and said release backing from said attaching station to said printing station.

4,111,122

METHOD OF AND APPARATUS FOR THREADING WEB MATERIAL PREFERABLY INTO WEB-FED ROTARY PRINTING PRESSES

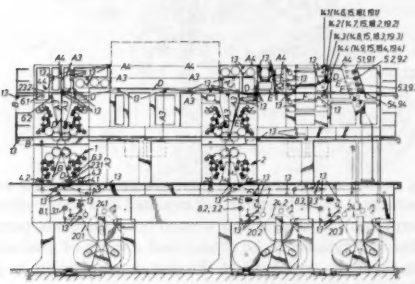
Willi Albert Peter Kutzner, and Georg Schneider, both of Würzburg, Germany, assignors to Koenig & Bauer Aktiengesellschaft, Würzburg, Germany

Filed Jul. 14, 1976, Ser. No. 705,192

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1975, 2532168

Int. Cl.² B41F *13/02*; G03B *1/56*

U.S. Cl. 101—228 **11 Claims**



1. Apparatus for threading web material along a selected one of a plurality of paths of web feed through a web-fed rotary printing press comprising:

a finite length, flexible conveyor means, said conveyor means including first and second conveyor sections and at least one intermediate conveyor, said intermediate conveyor being one of a plurality of intermediate conveyor sections, each of said intermediate conveyor sections extending through the press along one of said paths of web feed, each said intermediate conveyor section having means for fastening the web to be threaded, and each said conveyor section further having joints for selectively connecting conveyor sections to each other;

first and second storage means for said first and second conveyor sections, respectively, said first and second storage means being positioned at the start and end of the paths of web threading; and,

first and second drive means cooperating with said first and second storage means to move said conveyor means between said storage means whereby the web secured to said conveyor means is threaded through the press along the selected path of web feed defined by the intermediate conveyor section selected and joined to said first and second conveyor sections.

4,111,123

BENDING-RESISTANT GRIPPER CARRIAGE SUPPORT STRUCTURE, PARTICULARLY FOR OFFSET PRINTING MACHINES

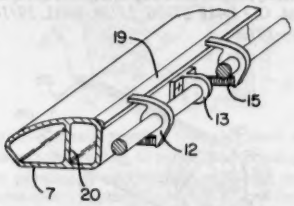
Eberhard Willeitner, Utting am Ammersee, Germany, assignor, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Germany

Filed Feb. 18, 1977, Ser. No. 770,019

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606345; Feb. 18, 1976, 2606346

Int. Cl.² B41F *21/04*

U.S. Cl. 101—407 A **14 Claims**



1. A bending-resistant gripper carriage arrangement for offset printing machines which, in order to increase the area moment of inertia and provide a high bending resistance, comprises at least one one-piece closed unperforated hollow profile member, a gripper shaft supported by said profile member, and gripping brackets carried by said gripper shaft for movement between a sheet gripping and a sheet releasing position, said profiled member being hollow throughout its length and having a continuous, smooth, curved, upper, outer sheet receiving surface extending for the entire length of the profiled member and wherein said gripping brackets grip a sheet between said brackets and said upper outer sheet receiving surface of the profile member in said sheet gripping position.

4,111,124

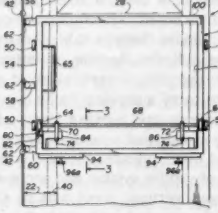
METHOD AND APPARATUS FOR PRODUCING FACTORY-TRIMMED WALL COVERING

Frank R. Pascale, 40 Park Way, Sea Cliff, N.Y. 11579, and Ralph I. Preuss, 19 Wellsley Rd., Rockville Centre, N.Y. 11570

Filed Mar. 18, 1977, Ser. No. 779,265

Int. Cl.² B41M *1/12*; B26D *5/08*

U.S. Cl. 101—426 **4 Claims**



1. A method of producing an elongated strip of printed wall covering without unprinted selvage areas along opposite edges thereof using an elongated wall covering support surface having a position-establishing reference edge oriented lengthwise

of said support surface adjacent one edge thereof, said method comprising the steps of arranging a blank strip of wall covering in fixed position on said support surface in aligned relation to said reference edge, successively printing length segments of said wall covering strip with a design having design-delineating lines on opposite side edges thereof delineating the printed design located in a medial area on said wall covering from unprinted selvage areas located along the opposite peripheral side edges of said wall covering strip, said successive imprints of said wall covering design being positioned on said wall covering strip using said reference edge to correspondingly position each said opposite edge design-delineating line a prescribed uniform distance from said reference edge, and while said printed wall covering strip is in said fixed position on said support surface severing free said opposite unprinted selvage areas along said design-delineating lines thereof by using said reference edge to position a means effective to sever said wall covering in aligned cutting relation to said design-delineating lines, whereby the resulting printed wall covering is effectively trimmed preparatory to use.

4,111,125

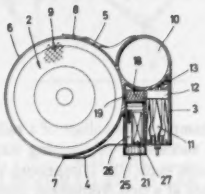
STAYED GROUND MINE, ESPECIALLY FOR RIVERS

Horst Reineke, Rosental 14, 53 Bonn, Germany

Filed Sep. 25, 1970, Ser. No. 75,032

Int. Cl.[2] F42B *22/04*

U.S. Cl. 102—18 R **10 Claims**



1. An anchored mine, comprising, a disc-shaped explosive body, a housing having a fuze device with a propagation charge for said explosive body consisting of a thin partition lying at the edge of said explosive body, said housing having attached thereto two arms for encompassing a portion of said disc-shaped explosive body, a banding device for encompassing and fastening said explosive body to said fuze device, said banding device consisting of a band, hinge means for connecting one end of said band to one of said arms, and clamp means for tensioning said band and locking the other end of said band to the other arm of said two arms, said fuze device being positioned next to said thin partition and adjacent to said explosive body.

4,111,126

WARHEAD FOR USE AGAINST ARMORED TARGETS

Franz Rudolf Thomanek, Sandizell b. Schrobenhausen, Germany, assignor to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Ottobrunn, Germany

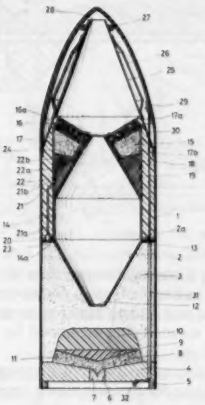
Filed Jun. 20, 1973, Ser. No. 372,404

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1969, 1901472

Int. Cl.[2] F42B *11/14*

U.S. Cl. 102—52 **13 Claims**

1. A warhead for use against armored targets, comprising an axially elongated warhead housing, a forward or nose end and a rearward end, a shaped first charge located within and at the rearward end of said housing and having a conically shaped liner, with the axis of said liner extending in the axial direction of said housing, and with the sides of the liner diverging in the direction of the forward end of said housing, an open-ended protective sleeve located within and spaced inwardly from said housing and extending toward the forward end of said housing from the end of said first charge closer to the forward end of said housing, said protective sleeve being concentric to the axis of said liner and comprising a cylindrically shaped portion extending axially from the end of said first charge closer to the forward end of said housing, and a truncated conical portion extending from said cylindrically shaped portion toward the forward end of said housing with the sides of said conical portion converging toward the forward end of said housing, the smaller end of said truncated conical portion being spaced from the forward end of said housing, an annular second charge concentrically positioned about said conical portion, an active liner disposed in contact with the surface of said second charge which faces toward the forward end of said housing,



filler means located within the space between said protective sleeve and said housing for rigidly positioning said second charge and active liner, and ignition means extending between said first charge and said second charge for igniting said second charge from said first charge with a predetermined time delay after the ignition of said first charge, said ignition means comprising a first cap containing an explosive in contact with the end surface of said first charge closer to the forward end of said housing, a second cap containing an explosive in contact with the end surface of said second charge directed toward the forward end of said housing, and detonation cord extending through said filler means between said first cap and said second cap.

4,111,127

CENTRIFUGAL ROLLING BALL LOCKING DEVICE

Albertus E. Schmidlin, Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 19, 1977, Ser. No. 825,887

Int. Cl.[2] F42C *15/22*

U.S. Cl. 102—237 **6 Claims**

1. A centrifugal rolling-ball, fluidically damped, locking device for restraining loosely stacked elements contained within a spin stabilized projectile which comprises;

a cup shaped housing operatively disposed in said projectile so that a longitudinal axis of said housing is disposed parallel to the principal longitudinal axis of said projectile and offset therefrom by a distance "*d*", said housing having a closed end and an internally threaded open end;

stationary ramp means fixedly positioned in said closed end of said housing for providing a first caming surface at said closed end of said housing;

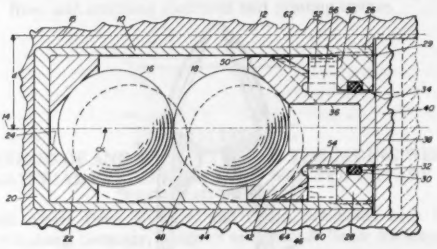
a first spherical member disposed within said housing and in contact with said stationary ramp means, said first spherical member being inertially responsive to the centrifugal force of spin of said projectile;

a second spherical member operatively positioned within

said housing and in rolling point contact with said first spherical member, said second spherical member being inertially responsive to the centrifugal force of spin of said projectile;

piston-cam-plunger means, slidably disposed in said housing in abutment with said second spherical member, for providing an axial force to restrain said loosely stacked elements of said projectile during projectile launch, said second spherical member being in rolling contact with said piston-cam-plunger means;

sealing member means screwedly attached to the internally threaded open end of said housing, said sealing member



means having a central plunger stem bore therein adapted for slidable passage of said piston-cam-plunger means therethrough, said sealing member means and said piston-cam-plunger means being separated by an annular reservoir volume; and

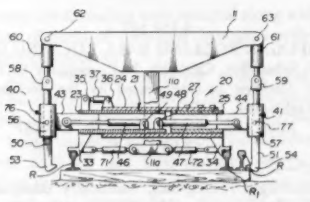
damping fluid means operatively disposed in said annular reservoir volume for limiting shock impact to said loosely stacked elements of said projectile during projectile launch and for lubricating said piston-cam-plunger means when said piston-cam-plunger means is linearly moved within said housing by said second spherical member in response to the centrifugal force of spin of said projectile.

4,111,128

SWITCH LIFTING FRAME

John Keyes, Hammond, Ind., assignor to Canron Railgroup, West Columbia, S.C.

Filed Feb. 20, 1976, Ser. No. 659,849
Int. Cl.[2] E01B *27/17*
U.S. Cl. 104—7 B **8 Claims**



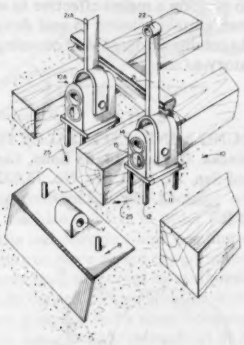
1. A railroad track lifting and aligning apparatus mounted for track travel on a longitudinally extending main frame, comprising a rail engaging sub frame extending transversely of the main frame and having two members connected for relative adjustment transversely of the main frame; a rail contacting element on each member for abutting the inside of a rail of the track; means to adjust and maintain the relative position of the members transversely of the main frame whereby to adjust the track gauge spacing between the rail contacting elements; a pair of substantially vertically extending rail hook guide means, one for each rail of the track, means for moving the guide means transversely of the main frame on the sub frame; rail hook means for each guide means for externally engaging each rail of the track; a track lifting jack for each rail connected on the one hand to said main frame and on the other to a rail hook means for adjusting the rail hook means into and out of the rail engaging position; and track aligning jack means operatively connected between said main frame and said sub frame.

4,111,129

METHOD AND APPARATUS FOR THE VIBRATORY TAMPING OF RAILWAY TRACKS

Helmuth von Beckmann, Columbia, S.C., assignor to Canron Railgroup, West Columbia, S.C.

Filed Mar. 31, 1976, Ser. No. 672,498
Int. Cl.[2] E01B *27/16*
U.S. Cl. 104—12 **3 Claims**



1. A method of tamping the ballast of a railroad track comprising applying a succession of tamping steps at a series of points along the track, each step comprising vibrating a vibration imparting means at a first frequency; inserting said means into said ballast; increasing the frequency of vibration of said means to a second frequency so as to impart an excitation frequency to the ballast; shaping the ballast whilst it is so excited; reducing the frequency of vibration of said means to a third frequency; and withdrawing said means from said ballast.

4,111,130

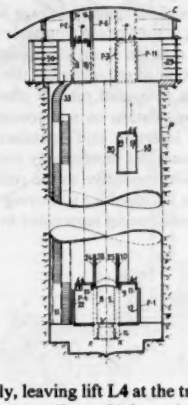
METHOD OF TRANSFERRING PASSENGERS FROM VEHICLES TO A STATION

Frédéric B. Rodot, 6A ave. de l'Ouche, Dijon, France (21000)

Filed Nov. 16, 1976, Ser. No. 742,277
Claims priority, application France, Nov. 25, 1975, 75 36896
Int. Cl.[2] B61B *1/02*
U.S. Cl. 104—28 **1 Claim**

1. The method of operating in synchronism, vehicles moving in succession at predetermined time intervals on and along a roadway at a transit level, with four lifts L1, L2, L3 and L4 translatable vertically between the transit level and an entry level spaced vertically from the transit level, there being two lifts in side-by-side relation on each respective side of the track, lifts L1 and L4 being directly opposite and lifts L2 and L3 being directly opposite, said method comprising: emplacing lifts L4 and L1 at the transit level on arrival of a first vehicle at the transit level, for entrance to and exit from the first vehicle, respectively, translating lift L4 to the entry level on departure of the first vehicle, while leaving lift L1 at the transit level pending arrival of the second vehicle, emplacing lift L2 at the transit level on arrival of the second vehicle at the transit level for entrance to and exit from lifts L1 and L2 respectively, translating lift L1 to the entry level on departure of the second vehicle while leaving lift L2 at the transit level pending arrival of the third succeeding vehicle, emplacing lift L3 at the transit level on arrival of the third vehicle for entrance to and exit from lifts L2 and L3, respectively, translating lift L2 to the

entry level on departure of the third vehicle, while leaving lift L3 at the transit level pending arrival of the fourth succeeding vehicle, emplacing lift L4 at the transit level on arrival of the fourth succeeding vehicle for entrance to and exit from lifts L3



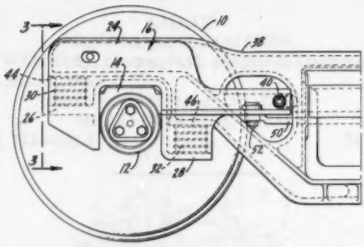
and L4, respectively, leaving lift L4 at the transit level pending arrival of the fifth succeeding vehicle, and repeating the timed arrival and departure of vehicles and translation of lifts, as aforesaid.

4,111,131

RESILIENT RAILROAD CAR TRUCK

Robert L. Bullock, Lombard, Ill., assignor to Standard Car Truck Company, Chicago, Ill.

Filed Jan. 19, 1976, Ser. No. 650,522
Int. Cl.[2] B61F *3/08, 5/30, 5/38, 5/50*
U.S. Cl. 105—224.1 **11 Claims**



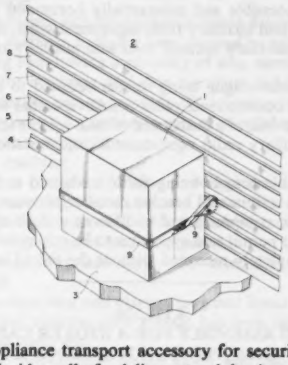
1. In a railroad car truck having a pair of wheelsets and means for providing relative restraint between wheelsets, a pair of side frames, means for supporting said side frames on said wheelsets including resilient means supported on said wheelsets and supporting said side frames, said resilient means providing greater shear resistance in a lateral horizontal direction than in a longitudinal horizontal direction and including a pair of spaced pad elements supported on opposite sides of each wheelset axis, each pad element including alternate resilient and generally rigid layers, with at least one of the generally rigid layers on opposite sides of at least one resilient layer being shaped to restrict the volume of material distortable in the lateral direction whereby there is less volume of distortable material in the lateral direction than in the longitudinal direction.

4,111,132

APPLIANCE TRANSPORT ACCESSORY

Louis Plut, 471 Wilde Ave., San Francisco, Calif. 94134

Filed Jun. 23, 1977, Ser. No. 809,376
Int. Cl.[2] B60P *7/08*
U.S. Cl. 105—469 **1 Claim**



1. An appliance transport accessory for securing an appliance to an inside wall of a delivery truck having a plurality of spaced parallel substantially horizontally extending cross pieces affixed to an inside surface of an inside wall thereof in spaced relation therewith, said appliance transport accessory comprising

strap means for releasably securing an appliance to the cross pieces of the inside wall of the truck with sufficient tension to prevent jarring or movement of the appliance, said strap means having spaced opposite first and second ends, a hook device affixed to the first end thereof for releasably securing said first end to a cross piece when said strap means passes around said appliance, a projecting device affixed to the second end thereof and extending therefrom and a strip of elastic material interposed in the strap means between the first and second ends thereof for providing elasticity in the strap means; and

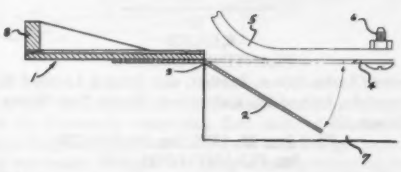
slot means affixed to the strap means in the area of the second end thereof but spaced from said second end for releasably accommodating the projecting device in a manner whereby the length of the strap means between the slot means and the projecting device is passable around a cross piece and said projecting device is releasably secured in said slot means to releasably secure the appliance to said cross piece.

4,111,133

APPARATUS FOR CONCEALING AUXILIARY EQUIPMENT AND METHODS OF CONSTRUCTING AND UTILIZING SAME

C. Richard Bailey, 31885 Nottingwood Dr., Farmington, Mich. 48018

Filed Mar. 21, 1977, Ser. No. 779,603
Int. Cl.[2] A47B *23/00*
U.S. Cl. 108—45 **6 Claims**



1. An apparatus for minimizing theft of and for concealing radio equipment in a vehicle, comprising:

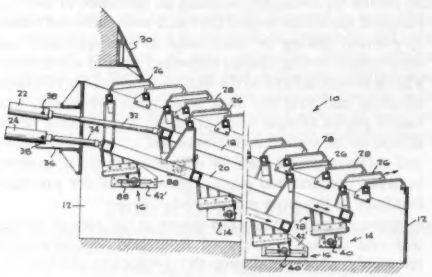
a shelf member including a forward end and a rearward end;
a bendable tongue protruding from said rearward end of said shelf member for removably securing said apparatus over said auxiliary radio equipment when said auxiliary radio equipment is in an installed position;
said bendable tongue being adapted to be bent to vary the relative angular relationship between said tongue and said shelf member to permit said shelf member to be disposed in an accessible and substantially horizontal position to conceal said auxiliary radio equipment when said apparatus is removably secured over said auxiliary radio equipment;
said bendable tongue being further adapted to be received within a conventional radio bracket member secured to a lower surface of a dashboard of said vehicle for mounting said auxiliary radio equipment in said installed position; and
said bendable tongue being further adapted to be slidably received within said bracket member between said auxiliary radio equipment and said lower surface of said dashboard, to permit said apparatus to be selectively mounted and completely removed without the use of tools.

4,111,134

BEARING ASSEMBLY FOR A STOKER CARRIAGE

Christian M. Mainka, New York, N.Y., assignor to Morse Boulger, Inc., New York, N.Y.

Filed Oct. 22, 1976, Ser. No. 734,760
Int. Cl.[2] F23B *1/20, 1/22*
U.S. Cl. 110—328 **14 Claims**



8. A reciprocating stoker assembly for operation in an incinerator or the like, said assembly including a stoker grate housing, a plurality of stationary grates mounted on the housing, a stoker grate carriage, a plurality of movable grates mounted on said stoker grate carriage and extending between said stationary grates, a drive mechanism for reciprocating said grate carriage, a plurality of shafts mounted on said stoker housing with the axis of the shaft generally perpendicular to the desired line of movement of said grate carriage, a bearing means journaled on each of said shafts, means for permitting limited angular and axial movement of the bearing means with respect to the shaft, a downwardly opening guideway mounted on said grate carriage, wear surface means mounted on said bearing means and engageable with said guideway for permitting reciprocation of said guideway with respect to said wear surface means.

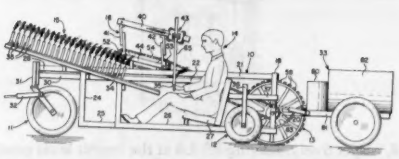
4,111,135

PLANTING MACHINE

Leonard Charles Braun, Bartlett, and Edward Leonard Benno, Grayslake, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 28, 1976, Ser. No. 700,270
Int. Cl.[2] A01C *11/00, 5/02*
U.S. Cl. 111—2 **1 Claim**

1. In a planting machine, means for moving said machine along the ground, a mechanism for inserting an elongated container with a plant growing therein in a vertical direction a substantial depth into the ground and substantially absent any horizontal movement of the container and plant relative to the ground while said container and plant are held by said mechanism for inserting and the machine is moving along the ground, said mechanism comprising an elongated tubular plant holder formed to encircle and frictionally engage said elongated container to be inserted in the ground, rotatable members mounted in said machine for rotation about an axis substantially perpendicular to the direction of movement of the machine, movable means carrying said elongated tubular plant holder in a substantially vertical orientation on said rotatable members, said rotatable members inserting said container frictionally held therein into the ground in a substantially vertical direction and to a substantial depth responsive to the rotation of said rotatable members while the machine is moving along the ground, a ground drive wheel rotating responsive to movement of said



machine along the ground, driving means connected between said ground drive wheel and said rotatable members for rotating said rotatable members responsive to rotation of said ground drive wheel, and said movable means normally carrying said plant holder on and with said rotatable members but permitting movement of said plant holder on and relative to said rotatable members in both directions along a line longitudinally of said machine and in the direction said machine moves along the ground when said plant holder engages the ground, said movable means being a resiliently biased roller carriage, said movable means preventing said rotatable means from moving said movable means relative to the ground along a line longitudinally of said machine while said rotatable members are inserting said tubular plant holder with said container and plant therein into the ground in a substantially vertical direction and to a substantial depth and while retracting said tubular plant holder out of the ground.

4,111,136

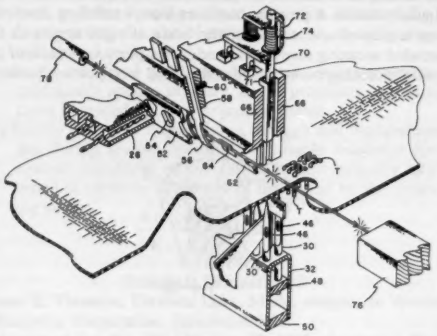
YARN CLAMPING APPARATUS

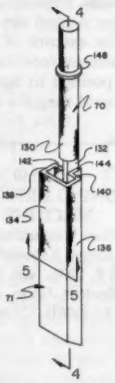
Abram N. Spanel, Princeton, N.J.; P. Frank Eiland, Stamford, and David R. Jacobs, New Canaan, both of Conn., assignors to Abram N. Spanel, Princeton, N.J.

Filed Jun. 30, 1977, Ser. No. 811,970
Int. Cl.[2] D05C *15/16*
U.S. Cl. 112—79 R **21 Claims**

1. Tufting apparatus or the like including:
bit-applying means including tufting needles for applying tufts to a backing layer wherein the improvement com-

prises clamping means associated with said bit-applying means to clamp yarn once loaded in said bit-applying





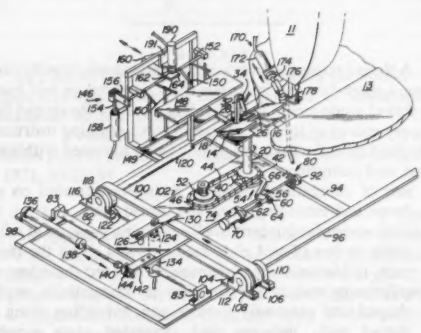
means, said clamping means including shield means to shield said yarn from being impaled by said needles.

4,111,137

CUFF MAKING MACHINE

Robert Willis Kirby, Kinston, N.C., assignor to Hampton Industries, Inc., Kinston, N.C.

Filed Oct. 1, 1976, Ser. No. 728,700
Int. Cl.[2] D05B *21/00, 33/00*
U.S. Cl. 112—121.15 **24 Claims**



1. Apparatus for sewing seams on a workpiece comprising:
a rotatable workpiece clamp for holding a workpiece;
said clamp being secured to a shaft for rotation therewith;
means for reciprocating said clamp between a forward and a rearward position;
means for stitching a seam to an edge of a workpiece while said means for reciprocating said clamp is moving said clamp from one of said forward and rearward directions;
drive means for rotating said shaft and said clamp in 90° increments after a seam has been stitched to an edge of a workpiece;
said drive means including a motor means drivingly coupled to said shaft, an indexing cam secured to said shaft, said indexing cam having a plurality of stop members, a pawl means for engaging said stop members and for allowing said indexing cam to rotate in 90° increments.

15. An apparatus for sewing a pair of parallel spaced seams on a workpiece comprising:
a sewing machine;
a workpiece clamp for holding a workpiece;
means for moving said clamp in a linear direction from an initial position past said sewing machine to stitch a seam along a first edge of said workpiece;
means for rotating said clamp 180° after said first edge is stitched;
means for returning said clamp along said linear direction to said initial position after a seam has been stitched along said first edge; and
means for moving said clamp along said linear direction from said initial position past said sewing machine to stitch a seam along a second edge of said workpiece, said second edge being generally parallel to and spaced from said first edge.

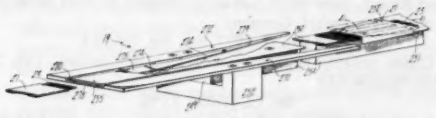
19. A workpiece clamp for holding workpieces while said workpieces are being sewn comprising:
a top plate,
a bottom plate;
a hinge communicating said top plate to said bottom plate;
said plates being pivotable with respect to one another;
a movable piston rod for pivoting said plates with respect to one another, said rod having a free end attached to one of said plates;
a cylinder carrying said piston rod for movement with respect to said cylinder;
a hollow rotatable shaft;
the other plate being fixedly attached to said shaft;
means for rotating said shaft;
a source of pressurized air;
said pressurized air communicating with said cylinder by way of said hollow shaft for moving said piston rod.

4,111,138

SEWING MACHINE MATERIAL PREASSEMBLY SYSTEM

John L. Rockerath, and Harold J. Schreck, both of Utica, N.Y., assignors to Cluett, Peabody & Co. Inc., Troy, N.Y.

Division of Ser. No. 619,968, Oct. 6, 1975, Pat. No. 4,009,672.
This application Nov. 3, 1976, Ser. No. 738,746
Int. Cl.[2] D05B *35/02, 27/00*
U.S. Cl. 112—141 **6 Claims**



1. A sewing machine system having material conveyance means for forwardly conveying first material blanks, each having a longitudinally extending outer lateral edge, individually in succession along a first longitudinally extending horizontal path and through a sewing station, and for forwardly conveying second longitudinally extending narrow material blanks individually in succession along a second longitudinally

extending path, overlying said first horizontal path and converging therewith, and into overlying superimposed association with the first material blanks respectively at the convergence of the paths as the first material blanks are longitudinally forwardly conveyed individually along the first path to form material preassemblies thereof prior to the sewing station, a second material blank folding device mounted along the second overlying path for prefolding both lateral edges of the second narrow material blank as it is conveyed longitudinally forwardly along the second path to the convergence of the material paths to form said material preassemblies with the second material blanks prefolded, the second material blank folding device comprising a central longitudinally extending base plate for supporting the narrow material blank and having longitudinally forwardly extending and laterally tapering lateral edges for providing increasing depending lateral edge portions of the narrow material blank as it is conveyed longitudinally forwardly along the base plate, and a longitudinally extending edge guide along and under each lateral edge of the base plate and spaced therefrom for laterally folding the respective depending edge portions inwardly to underlie the base plate as the second material blank is conveyed longitudinally forwardly therealong, the material conveyance means being operable for longitudinally forwardly conveying the material preassemblies individually along the first horizontal path through the sewing station, and sewing apparatus at the sewing station for sewing the material preassemblies as they are longitudinally forwardly conveyed through the sewing station by the conveyance means.

3. An edge folding device for use in a sewing machine installation having a belt conveyor with conveyor belts for conveying elongated narrow material blanks through the folding device, for automatically prefolding both lateral edges of an elongated narrow material blank and supporting the material blank and conveyor belts as the material blank is conveyed longitudinally forwardly through the edge folding device with the belt conveyors, comprising a central longitudinally extending flat base plate with an upper flat face for supporting the narrow material blank and having longitudinally forwardly extending and laterally tapering lateral edges for providing increasing depending lateral edge portions of the narrow material blank as it is conveyed longitudinally forwardly along the base plate, and longitudinally extending edge guide plates along and under the lateral edges of the base plate and spaced therefrom for laterally folding the respective depending edge portions inwardly to underlie the base plate as the material blank is conveyed longitudinally forwardly therealong by the conveyor belts, each guide plate comprising a laterally outer plate portion with an upper flat face generally coplanar with the upper flat face of the flat base plate and a laterally inner flat plate portion extending longitudinally under the respective lateral edge of the base plate and spaced therefrom for laterally folding the respective depending edge portion of the material blank to underlie the base plate as the material blank is conveyed longitudinally forwardly through the folding device by the conveyor belts.

4,111,139
MULTINEEDLE GUARD CONSTRUCTION

Kurt Klundt, Hirschhorn, Germany, assignor to Pfaff Industriemaschinen GmbH, Germany

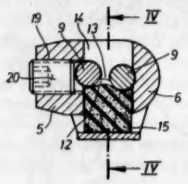
Filed Feb. 2, 1977, Ser. No. 764,813

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 76.06004[U]

Int. Cl.[2] D05B *55/02*

U.S. Cl. 112—226 **5 Claims**

1. A needle clamp, comprising a needle clamp body having a plurality of spaced parallel needles receiving bores defined therein, a needle having a shank portion positioned in each of said bores, said clamp body having a web portion which is laterally displaced and which is defined between adjacent needle receiving bores, a pressing screw threaded into said needle clamp body and bearing against the side of one of said needles which is positioned in the respective bores on a side thereof opposite to said web portion and substantially perpendicular to the axis of the needle receiving bores so as to urge said needle in a direction against said web portion and next adjacent needle a pressing member bore extending inwardly from a side of said needle clamp body at right angles to the threaded securing screw bore and into a portion of each of the needle receiving bores to the end of said web portion between



said needle receiving bores, a resilient member disposed in said connecting bore bearing against the needles therein, a plate member disposed on the exterior of said needle clamp body closing the resilient member receiving bore and holding the resilient member in a position to bear against the needles to hold them in position until they are secured by said securing screw.

4,111,140
THREAD TENSIONING DEVICE FOR A SEWING MACHINE

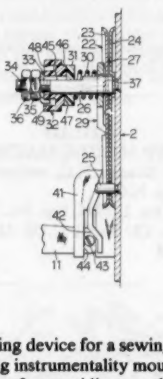
Tohru Gonnai, and Chikao Yamashita, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 8, 1976, Ser. No. 703,380

Claims priority, application Japan, Jul. 8, 1975, 50-83673

Int. Cl.[2] D05B *47/04, 47/02*

U.S. Cl. 112—254 **10 Claims**



1. A thread tensioning device for a sewing machine having a frame, a stitch-forming instrumentality mounted on said frame, and thread guide means for providing a path of the thread from a supply source of the thread to said stitch-forming instrumentality, said thread tensioning device being mounted within said frame, and comprising:

a pair of elongated rigid plate members mounted on said frame and extending along the thread path;

biasing means for concentratedly applying pressure at a fixed point on one of said plate members and along the thread path, to bias said one plate member toward the other; and

gap-forming means for forming a substantially wedge-shaped and extremely narrow gap, extending along the thread path, between said elongated plate members against said biasing means; and

wherein said plate members contact one another at the ends thereof;

wherein said gap-forming means include projection means

for forming a fulcrum for said one plate member at a point sufficiently away from the contacting ends of said plate members and on said thread path between said plate members, and for forming a fixed clearance, substantially at least equal to the size of standard thread, at said point on said thread path; and

wherein said fixed point, at which said biasing means concentratedly applies pressure, lies in proximity to said fulcrum provided by said projection means;

whereby when the thread passes through said wedgeshaped gap during sewing operation, a suitable resistance force against movement of the thread is automatically established in response to the size of the thread by the tensioning device.

4,111,141

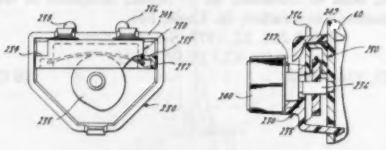
THREAD TENSIONER

James E. Thomson, Pleasant Lake, Mich., assignor to Western Stamping Corporation, Jackson, Mich.

Division of Ser. No. 589,552, Jun. 23, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 754,013

Int. Cl.[2] D05B *47/02*

U.S. Cl. 112—254 **19 Claims**



1. A thread tensioner for a sewing machine comprising a box-like housing having a front wall and a top wall and having a transversely extending opening extending forwardly in the top wall from a position spaced rearwardly from the front wall, said opening continuing uninterruptedly part way down the front wall, a guide finger integral with the housing and having a top portion having a smooth bottom surface and extending forwardly from a mid portion of the rear margin of the opening in the top wall substantially parallel to the top wall and having a depending portion extending downwardly and forwardly part way in the opening in the front wall to a position outspaced from the front wall, the sides of said finger being spaced from both lateral ends of the opening, a friction block in the housing having a smooth top whereby the mid portion of a thread can be hooked under the finger and moved upwardly and rearwardly over the block to a position interposed between the top of the block and the bottom surface of such top portion of the finger, and means for yieldably urging the block upwardly against a thread in such interposed position.

4,111,142

APPARATUS FOR HEATING SEAMS OF CANS

Kiyoshi Kawamata, Ohmiya, Japan, assignor to Nihon Seikan Kabushiki Kaisha, Ohmiya, Japan

Filed Jan. 6, 1976, Ser. No. 646,938

Claims priority, application Japan, Jan. 6, 1975, 50-4344; Feb. 24, 1975, 50-25191

Int. Cl.[2] F16B *11/00*

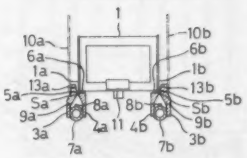
U.S. Cl. 113—1 E **9 Claims**

1. An apparatus for heating the adhesive-coated seams of cans while said cans are on a continuous conveyor, said seams including an end seam produced by curling the margin of the end plate of said can with the margin of the body of said can and a longitudinal side seam along the body of said can, said apparatus comprising:

at least one heat supply means for heating and blowing a flow of air;

at least one heated air guide means adjacent to said conveyor and at least partially surrounding said heat supply means and having an opening in one side thereof for concentrating the flow of blowing heated air from said heat supply means through said opening against said seams, said heated air guide means comprised of:

first and second guiding members spaced opposite and spaced from each other with a narrow slit therebetween,



whereby said heated air from said heat supply means is blown against said seam through said slit; and

heat holding means at least partially surrounding said conveyor for preventing the flow of heated air blowing through said slit between said guiding members from passing directly into the atmosphere surrounding said apparatus.

4,111,143

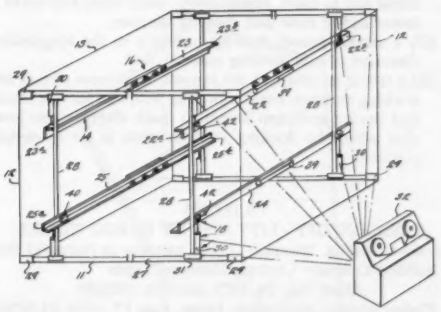
ASSEMBLY OF STRAIGHT DUCT AND TRANSITIONS

James Henry Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Apr. 18, 1977, Ser. No. 788,641

Int. Cl.[2] B21D *19/00*

U.S. Cl. 113—1 N **23 Claims**



1. Apparatus for effecting deformation of edge configurations of ductwork pieces to form a completed duct comprising:

a stationary frame member,

means for guiding the movement of ductwork pieces to be formed into duct with respect to said frame member,

said guiding means comprising a plurality of elongated guide rails, said guide rails being elongated in the direction of movement of ductwork pieces with respect to said stationary frame, and extending substantially the entire length of said stationary frame member, said guide rails all being movable with respect to said frame member,

means for moving said guide rails with respect to each other for adjusting the height and width of duct to be formed thereby,

roller means mounted on at least one of said guide rails for effecting deformation of edge portions of ductwork pieces by bending over an upstanding edge portion of an edge configuration of ductwork pieces to form duct seams, and

means for mounting said guide rails to said frame member.

4,111,144

SHIP'S DOCKING PLANT

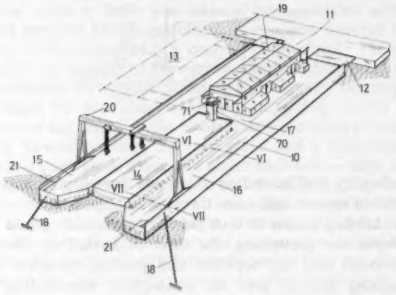
Sigurdur Ingvason, Gärdesvägen 31, Hovås, Sweden (43080)

Filed Dec. 22, 1976, Ser. No. 753,209

Claims priority, application Sweden, Jan. 12, 1976, 7600193; Nov. 10, 1976, 7612484

Int. Cl.[2] B63C *1/02*

U.S. Cl. 114—48 **7 Claims**



1. A ship's docking plant comprising

(A) a floating platform including at least one pair of parallel branches, defining between themselves a substantially rectangular opening and having a plane deck to provide a working area surrounding said opening along three of its sides,

(B) a docking member receivable in said opening and having a plane deck and being defined by two longitudinal and one inward, transverse side and one outward, transverse side,

(C) a number of tanks in said docking member and means to admit and to expel, respectively, water from said tanks to lower and to raise said docking member,

(D) a service tunnel running centrally in the longitudinal direction of said docking member, and

(E) a tower structure at the inward, transverse side of said docking member, communicating with said service tunnel, and having sufficient height to reach above water level, also when the docking member rests in its lowermost position.

4,111,145

ROLL ON/OFF - LIFT ON/OFF CARGO VESSEL

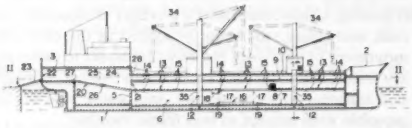
Teruhiro Ohsaka, Muroran, Japan, assignor to Narasaki Shipbuilding Company Limited, Muroran, Japan

Filed May 24, 1977, Ser. No. 800,059

Claims priority, application Japan, Aug. 17, 1976, 51/97942

Int. Cl.[2] B63B *27/00*

U.S. Cl. 114—72 **7 Claims**



1. A roll on/off-lift on/off cargo vessel comprising a hull, an upper exposed deck associated with said hull and having a plurality of hatch openings, means defining a plurality of superposed load surfaces within said hull beneath said exposed deck, said means defining said load surfaces comprising an inner bottom plating and at least one intermediate deck between said plating and said exposed deck, said plating and said exposed deck defining a cargo hold therebetween said at least one intermediate deck having a plurality of hatch openings, a plurality of open frame structures transversely disposed in said cargo hold in a spaced relationship to each other; each of said structures being dimensioned substantially to conform to the cross section of the hold, said open structures being readily closed by attachable partition plates and said structures each comprising side portions and a plurality of horizontal beams, said beams having upper surfaces substantially aligned with respective ones of said load surfaces to permit free movement of roll on/off traffic along said surfaces means providing roll on/off access to said load surfaces for traffic from outside the vessel and at least one liftable loading plate disposed to operate in one of said hatch openings of said at least one intermediate deck for transporting cargoes between the inner bottom plating and said at least one intermediate deck.

4,111,146

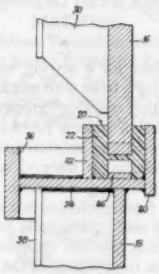
TANK SUPPORT JOINT

Robert A. Babcock, Duxbury; Rolf D. Glasfeld, and Luther E. Holt, both of Cohasset, all of Mass., assignors to General Dynamics Corporation, St. Louis, Mo.

Filed Jun. 22, 1977, Ser. No. 809,110

Int. Cl.[2] B63B *25/12*

U.S. Cl. 114—74 A **10 Claims**



1. In a marine vessel for transporting liquefied gas, a cargo tank for holding the liquefied gas, a support structure for supporting the tank in the hull of the vessel, which support structure includes a two-piece metallic skirt having a first portion connected to the tank and a second portion connected to the hull, annular trough means carried by one of said skirt portions and encircling said tank, the edge of said other skirt portion extending into said annular trough means but being spaced from contact with the walls of said trough means, and hardened material filling said trough means to a level beyond said edge of said other skirt portion to thereby rigidly structurally interconnect said skirt portions and prevent radial movement of one of said skirt portions relative to said other skirt portion.

4,111,147

COLLAPSIBLE BOAT ANCHOR

Gilles Morissette, 7950 Jacques Rousseau Ave., Apt. 403, Riviere-des-Prairies, Quebec, Canada (H1E 1J6)

Filed Apr. 26, 1977, Ser. No. 791,037

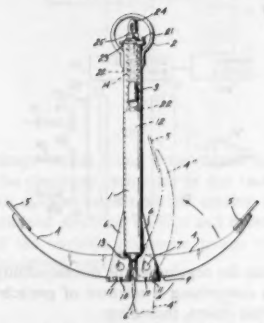
Claims priority, application United Kingdom, Apr. 28, 1976, 17225/76

Int. Cl.[2] B63B *21/24*

U.S. Cl. 114—298 **3 Claims**

1. A collapsible boat anchor comprising an elongated tubular shank member open at both ends, a line attachment means at one end, pairs of parallel fins secured to the other end of said

shank member and laterally extending therefrom, anchor flukes each having an inner end inserted between one of said pairs of fins and pivotally connected thereto about respective pivot pins for movement of said anchor flukes between three positions, namely: a storage position in which the anchor flukes extend alongside the shank towards said one end, an operative position extending generally laterally away from the shank, and an anchor-releasing position in which the anchor flukes extend longitudinally of, and away from, said one end, said fins protruding from an edge of the respective anchor flukes in the operative position of the latter and provided with a pair of registering holes adapted to receive a shear pin, a shear pin inserted in said registering holes, the shear pins of the associated anchor flukes being in the path of the latter to prevent said anchor flukes from pivoting from said operative to said anchor-releasing position, whereby said last-named pivoting movement is accomplished only upon braking of said shear



pins by said flukes, a plunger mounted within said tubular shank and protruding from the other open end of said shank, a removable cap for closing said one end of said tubular shank, means to removably secure said cap to said one end, a spring disposed within said tubular shank and abutting against said cap at one end and against said plunger at the other end, said spring compressible by movement of said plunger towards said one end, said anchor flukes having flats at their pivoted end which are engaged by said plunger in the operative and storage positions, respectively, of said anchor flukes, whereby said anchor flukes can be pivoted between said operative and said storage position by displacing said plunger against the bias of said spring, and further including a bolt screwed within said cap extending through said spring and adapted to abut against said plunger, said bolt in an adjusted position thereof relative to said cap, preventing longitudinal movement of said plunger and maintaining the same against said flats in the operative position of said anchor flukes.

4,111,148

APPARATUS FACILITATING REMOVAL OF A KORT RUDDER RING ON A MARINE VESSEL

Colin Wray Herbert, 44 High Street, Stokesley, Tees-side, North Yorkshire, England

Continuation of Ser. No. 682,903, May 4, 1976, abandoned. This application Jul. 7, 1977, Ser. No. 813,766

Claims priority, application United Kingdom, May 5, 1975, 18671/75

Int. Cl.[2] B63H *23/32*

U.S. Cl. 115—76 **5 Claims**

1. A propulsion unit for a marine vessel, comprising

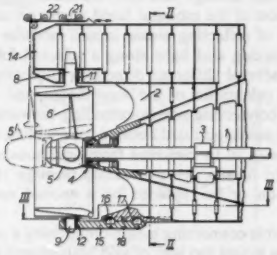
a hull supporting upper and lower vertical bearings at its aft end;

a drive shaft extending in a horizontal straight line from within said hull;

propeller blades individually removably mounted on said shaft outside said hull;

a Kort rudder ring surrounding said propeller and carrying upper and lower vertical journals mounted for rotation in said upper and lower bearings, respectively, and

a housing containing said lower bearing, said housing connected to said hull by removable means enabling said housing and said lower bearing to be lowered directly from said hull and said lower journal, said housing extend-



ing forwardly beyond the forward end of said Kort rudder ring so that in response to removal of said housing and at least some of said blades, said upper journal is downwardly slidable from said upper bearing so as to permit downward removal of said Kort rudder ring from said hull for inspection of said upper and lower journals.

4,111,149

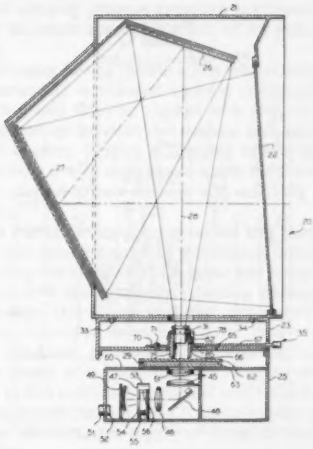
OPTICAL STRUCTURE FOR MICROFICHE READER

Thomas R. Wells, Des Plaines, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 532,802, Dec. 16, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 716,740

Int. Cl.[2] G03B *21/22*

U.S. Cl. 353—78 **7 Claims**



1. A modular system forming a microfiche image reader having:

a housing with a modular hood means superimposed thereon, said housing comprising modular parts which may be replaced or interchanged;

optical projection means in said housing including a first module means including a source of light having at least a condenser lens, and a bulb which should not be touched by a human hand, said first module means being replaced as a unit, magnification means for projecting said light in a path from said housing, and means for supporting a microfiche in said path;

said modular hood means is removably seated on said housing in any of at least two different orientations;

corresponding aperture means in abutting top and bottom walls of said housing and said modular hood means respectively said modular hood means being located in said light path whereby an image of a microfiche in said support means in said light path is projected into said modular hood means through said aperture means regardless of the orientation of the modular hood means on said housing;

a plurality of reflecting means in said modular hood means for projecting said light along a selected folded path, in one of several different directions depending upon the selected orientation of the hood means; and

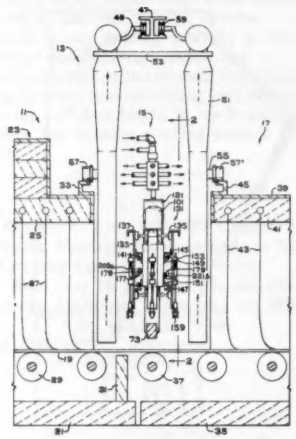
releasable connecting means extending between said modular hood means and said housing for enabling said modular hood means to be removed from said housing and either be moved from a first orientation through 180° to a new orientation or be replaced by a second modular hood means,

said releasable connecting means comprising a pair of spaced apertures in said top wall of said housing and a mating pair of pins in said bottom wall of said hood means, said apertures and said pins being on either side of and equidistant from the center of said corresponding aperture means whereby said modular hood means may be removed and rotated through 180° or replaced by another modular hood means.

4,111,150
APPARATUS FOR COATING AN ADVANCING SUBSTRATE

Harold E. Donley, Oakmont, and William P. Cathers, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1977, Ser. No. 782,132
Int. Cl.[2] B05B *3/00*; B05C *5/00*
U.S. Cl. 118—7 **6 Claims**



1. In an apparatus for dispensing a coating composition onto a surface of a substrate comprising a substrate conveying means having a plane of conveyance, an endless chain in a plane substantially parallel to the plane of the conveying means, a plurality of coating dispensers mounted on the chain, each oriented for dispensing a coating composition toward the plane of the conveyer, a rotatable coating composition distributing means for distributing coating composition to each dispenser and means for driving the chain and the rotatable distributing means to cause the dispensing means to twice traverse the conveying means during a cycle of rotation along paths extending across the conveying means transverse to an intended path of substrate conveyance, the improvement which comprises

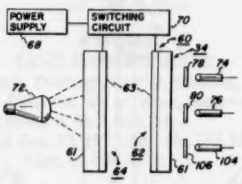
means for selectively operating a first set of the plurality of dispensers to cause them to dispense a first coating composition during a first traverse of the conveying means, and

means for selectively operating a second set of the plurality of dispensers to cause them to dispense a second coating composition during a second traverse of the conveyer means.

4,111,151
MULTI-PARTICLE DEVELOPABILITY REGULATING SYSTEM

Frederick R. Ruckdeschel, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 19, 1977, Ser. No. 798,533
Int. Cl.[2] B05C *11/00*
U.S. Cl. 118—7 **20 Claims**



1. An apparatus for regulating the developability of a development system comprising a mixture of particles having at least two different colors, including:

transparent electrode means electrically biased to attract a mixture of particles thereto;

means for illuminating said electrode means and the mixture of particles adhering thereto with light rays; and

means for sensing the intensity of the light rays transmitted through the mixture of particles adhering to said electrode means, said sensing means having peak transmittances at the wavelength of the peak transmittance of the resultant color formed by the mixture of different colored particles, at the wavelength of the minimum transmittance ratio of the differently colored particles forming the mixture and at the wavelength of the maximum transmittance ratio of the differently colored particles forming the mixture, said sensing means generating electrical signals indicative of the mass of each of the differently colored particles in the mixture.

4,111,152
ELECTROSTATOGRAPHIC APPARATUS COMPRISING IMPROVED DEVELOPMENT BIAS MEANS

Koji Sakamoto, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed May 12, 1977, Ser. No. 796,108
Claims priority, application Japan, May 17, 1976, 51-56386
Int. Cl.[2] G03G *15/044, 15/14*; B05C *11/00*
U.S. Cl. 118—7 **6 Claims**

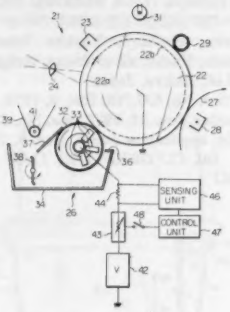
1. In an electrostatographic apparatus having a photoconductive member and a developing means for applying a toner substance to the photoconductive member for development, the combination comprising:

a variable bias voltage means for applying a bias voltage across the developing means and the photoconductive member, the bias voltage means comprising a fixed voltage source and a variable resistance means connected between the voltage source and the developing means;

sensing means for measuring the electrical resistance of the toner substance, the bias voltage means being responsive to the sensing means in such a manner that the bias voltage

is set for development in accordance with said resistance of the toner substance; and

a reference surface means provided on the photoconductive member, the sensing means being responsive to the electrical current through the voltage source, variable resistance means, toner substance and reference surface means, the



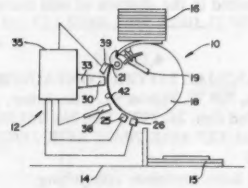
bias voltage means being constructed to automatically adjust the electrical resistance of the variable resistance means to a value such that the sensing means senses a predetermined electrical current and maintains said resistance of the variable resistance means constant at said value for development.

4,111,153

ADHESIVE DISPENSING APPARATUS FOR CARD TIPPER

Peter H. Rohrbach, Bethlehem, Pa., assignor to Harris Corporation, Cleveland, Ohio

Filed Oct. 14, 1977, Ser. No. 842,000
Int. Cl.[2] B05C *11/00*
U.S. Cl. 118—7 **12 Claims**



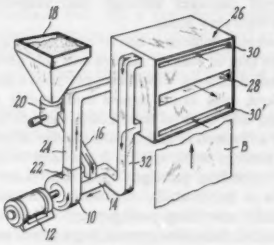
1. Apparatus for applying adhesive to a card or other insert to be adhered to a signature comprising adhesive dispensing means, means for moving said card in a path past said adhesive dispensing means, first card detector means positioned adjacent said dispensing means, second card detector means spaced from said first detector means, means for providing a signal to actuate said dispensing means when said card is detected by both said detector means, means for determining the speed of travel of said card in said path, and means responsive to a speed of travel of said card below a predetermined speed for periodically interrupting the actuation of said dispensing means during the passage of said card, whereby said card receives dots of adhesive from said dispensing means.

4,111,154

APPARATUS FOR THE SURFACE TREATMENT OF GALVANIZED SHEET-IRON

Roland Kissel, Le Vesinet, and Robert Wang, Wissous, both of France, assignors to Heurtey Metallurgie, Paris, France

Filed Apr. 11, 1977, Ser. No. 786,672
Int. Cl.[2] B05C *19/00*
U.S. Cl. 118—10 **7 Claims**



1. An apparatus for surface treating a sheet-iron strip which continuously emerges in a substantially vertical direction from a galvanizing bath with a liquid galvanizing metallic coating thereon, by spraying finely divided material particles onto the liquid metallic coating before the coating crystallizes, said apparatus comprising:

a housing formed by two identical casings disposed in spaced relation to each other to define therebetween a substantially vertically extending passage through which a coated strip is adapted to continuously pass;

each said casing having therein an enclosed interior divided by partitions into separate upper and lower recovery passages and a central spraying passage positioned between said upper and lower recovery passages, said recovery and spraying passages extending in substantially horizontal directions across the width of the respective said casing;

each said casing having therein a first substantially horizontally extending slot-shaped opening communicating the respective said spraying passage with said vertically extending passage between said casings, each said first slot-shaped opening forming a spraying nozzle disposed at substantially a right angle to and across the entire width of a strip adapted to pass through said vertically extending passage;

each said casing having therein second and third substantially horizontally extending slot-shaped openings communicating the respective said upper and lower recovery passages with said vertically extending passage between said casings, said second and third slot-shaped openings forming respective upper and lower recovery slots at upper and lower portions of the respective said casing, said recovery slots being disposed at substantially right angles to and extending across the entire width of a strip adapted to pass through said vertically extending passage;

means for distributing a supply of finely divided material particles;

a single blower having a suction side and a delivery side;

means connecting said suction side of said single blower to said distributor means such that said blower receives particles therefrom;

first conduit means connecting said delivery side of said single blower to said spraying passages of both said casings, such that said blower blows an air stream suspending particles therein into said spraying passages and sprays said air stream and suspended particles outwardly therefrom through the respective said spraying nozzles against opposite sides of a strip adapted to pass through said vertically extending passage;

the air throughput capacity of said blower being regulated

with respect to the vertical dimension of said casings such that a liquid metallic coating on a strip adapted to pass through said vertically extending passage sets before the strip passes completely through said vertically extending passage;

second conduit means connecting said suction side of said single blower to said upper and lower recovery passages of both said casings, such that said blower recovers said air stream and any particles remaining suspended therein by withdrawing said air stream into said upper and lower recovery passages through said respective upper and lower recovery slots;

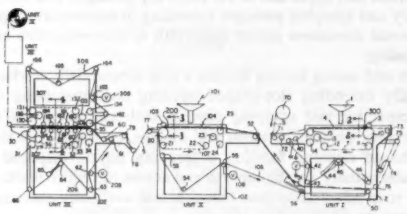
hood means, positioned above said housing, for collecting any portion of said air stream and any particles remaining suspended therein which escapes above said upper recovery slots, said hood means comprising a pair of hood casings, one each of said hood casings being positioned above a respective one of said casings of said housing, said hood casings being spaced from each other by said vertically extending passage, each said hood casing having therein a horizontally extending slot opening into said vertically extending passage; and

third conduit means for connecting both of said hood casings to a discharge fan for withdrawing any escaped portion of said air stream through said hood casings and to a particle separator for separating particles from such escaped portion of said air stream.

4,111,155
CATHODE COATING APPARATUS

Gerhart Paul Klein, Manchester, Mass.; John N. Oliver, Danville, N.H., and Arthur Emil Fitchman, Yonkers, N.Y., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Sep. 12, 1977, Ser. No. 832,257
Int. Cl.[2] B05C *9/04, 9/14*
U.S. Cl. 118—642 **6 Claims**

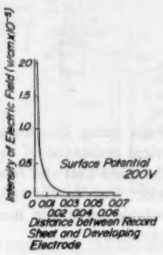


1. A machine for the continuous fabrication of electrochemical cell cathodes comprised of coated expanded material comprising means for dispensing a pasty coating material onto one side of a moving expanded substrate material, means for uniformly spreading said coating material onto said substrate, means for compressing said coating material onto said substrate, means for simultaneously therewith absorbing liquids expressed from said pasty material, wherein said absorbent means comprises a moving endless absorbent belt in contact with said substrate, and means for removing absorbed liquid from said belt, means for obverting said substrate onto a second moving endless absorbent belt, means for dispensing additional of said coating material onto the reverse side of said substrate, means for uniformly spreading said additional coating material, means for compressing said coating material onto said reverse side of said substrate, means for simultaneously therewith absorbing liquids expressed from said pasty material wherein said absorbent means comprises said second moving endless absorbent belt in contact with said coated substrate, and means for removing a substantial amount of said absorbed liquid from said second belt, means for calendering said dually coated substrate, means for absorbing liquids expressed from said dually coated substrate simultaneously therewith wherein said means comprises third and fourth moving endless absorbent belts in contact with said coated expanded material, individual means for removing absorbed liquid from said third and fourth belts, means for drying said calendered dually coated expanded material, and means for taking up the resulting dried dually coated expanded material.

4,111,156
DEVICES FOR DEVELOPING AN ELECTROSTATIC CHARGE IMAGE ON A RECORD SHEET BY A DEVELOPER SOLUTION

Masaji Nishikawa, Hachioji; Yoshiro Suzuki, Tama, and Tadahiro Yasuda, Fuchu, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 637,768, Dec. 4, 1975, abandoned. This application Jun. 22, 1977, Ser. No. 809,045
Claims priority, application Japan, Dec. 9, 1974, 49-140532
Int. Cl.[2] G03G *15/10, 15/06*
U.S. Cl. 118—662 **3 Claims**



1. A device for developing an electrostatic charge image on a record sheet by a developer solution, comprising: a tank containing a developer solution with charged particles dispersed therein, said record sheet being fed from one end of said tank into said developer solution and leaving said tank from another end thereof, and at least one pair of opposed rollers immersed in that part of said developer solution which is located at an intermediate region of said tank, said opposed rollers being resiliently urged against said record sheet under pressure and rotated so as to feed said record sheet through said developer solution, said opposed rollers immersed in said developer solution being formed of electric conductive material and one of said opposed rollers is connected through a resistor to one terminal of a D.C. supply source and the other roller is connected to the other terminal of said D.C. supply source, thereby preventing said electroconductive rollers from being shortcircuited in the absence of said record sheet.

4,111,157
ANIMAL LITTER CONTAINER

Donald Haugen, 709 W. Huron St., Ann Arbor, Mich. 48103

Filed Jan. 24, 1977, Ser. No. 761,990
Int. Cl.[2] A01K *29/00;* **A47K** *11/02*
U.S. Cl. 119—1 **15 Claims**

1. An animal litter container comprising:

a. a first enclosure portion;

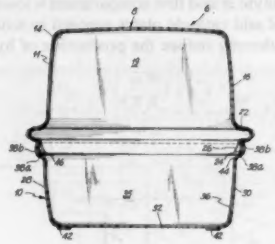
b. a second enclosure portion, one of said enclosure portions being disposed vertically above the other, said enclosure portions each being defined by a wall, such wall including generally upright wall portions and other wall portions joining said generally upright wall portions;

c. means in one of said side walls of one of said enclosure portions to provide access for an animal to said enclosed space, said first and second enclosure portions otherwise defining a completely enclosed space when joined together;

d. means on said first enclosure portion for coupling said first and second enclosure portions together in a substantially horizontal joining plane, at least part of said coupling

means restrainingly engaging said second enclosure portion;

e. means on said first enclosure portion for effecting movement of said coupling means out of restraining engagement with said second enclosure portion of said container, said moving means including a compressible resilient section of said wall of said first enclosure portion, said compressible resilient section having an outwardly convex bowed configuration, said compressible resilient section including first means for gripping said section in a first, substantially horizontal gripping plane and second means for gripping said section in a second, substantially



horizontal gripping plane, said gripping means being relatively movable by a manual squeezing action from a relaxed position wherein said first and second gripping means are vertically spaced from each other a given distance to a compressed position wherein said first and second gripping means are closer together and spaced from each other another distance which is less than said given distance, the movement of said first and second gripping means from said relaxed to said compressed positions effecting said movement of said coupling means out of restraining engagement, whereby said enclosure portions may be separated.

4,111,158

METHOD OF AND APPARATUS FOR CARRYING OUT AN EXOTHERMIC PROCESS

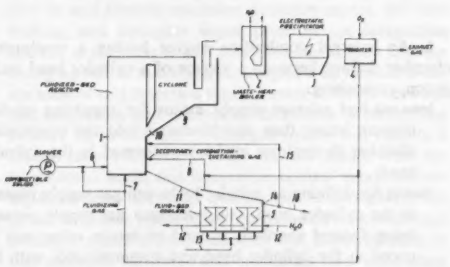
Lothar Reh; Martin Hirsch, both of Frankfurt am Main, and Ludolf Plass, Kronberg, all of Germany, assignors to Metallgesellschaft Aktiengelsellschaft, Frankfurt am Main, Germany

Filed May 26, 1977, Ser. No. 801,007

Claims priority, application Fed. Rep. of Germany, May 31, 1976, 2624302

Int. Cl.[2] F22B *1/02*; F23D *19/00*

U.S. Cl. 122—4 D **15 Claims**



1. A method of carrying out an exothermic process in which a combustible substance is burned in a bed of fluidized solids in a fluidized-bed reactor, solids entrained with gas from the bed are separated from the gas in a solid/gas separator, and separated solids are returned to the fluidized-bed reactor through a recycling conduit, the reactor, separator and recycling conduit forming a circulating system for the solids, said method comprising the steps of:

(a) feeding an oxygen-containing gas into said reactor on different levels in two partial streams whereby at least one of said streams is constituted as secondary gas and is introduced at least at one location above the level of introduction of fluidizing gas into the reactor;

(b) maintaining the volume ratio of fluidizing gas fed to said reactor and secondary gas between 1:20 and 2:1;

(c) introducing said gases into said fluidized-bed reactor so that said fluidized bed has a continuous solids density gradient from the bottom of the fluidized bed to the top of said fluidized-bed reactor and said bed has a mean density of the suspension above the secondary gas inlet of 10 to 40 kg/m^3

(d) feeding solids and a combustible component into a space in said fluidized-bed reactor below said secondary gas inlet and substantially free from internal fixtures;

(e) withdrawing hot solids from said circulating system;

(f) cooling the solids withdrawn in step (e) by direct and indirect heat exchange in a fluidized-bed cooler;

(g) recycling at least part of the cooled solids from step (f) to said reactor to maintain a predetermined constant reaction temperature therein; and

(h) feeding hot gas from said fluidized-bed cooler as said secondary gas to the fluidized-bed reactor.

14. A plant for the combustion of a combustible material which comprises:

(a) an upright fluidized-bed reactor comprising:

a fluidizing gas inlet at the bottom of said reactor, a secondary gas inlet opening into said reactor at a distance of at least one meter above said bottom of said reactor, the space within said reactor between said bottom and said secondary gas inlet being free from internal fixtures, and

an outlet at the top of said reactor for exhaust gas entraining solids therewith;

(b) a cyclone connected to said outlet for separating solids from said exhaust gas;

(c) a recycling conduit connecting said cyclone with the interior of said reactor for returning said solids to said reactor;

(d) means for withdrawing hot solids from the circulating system consisting of said reactor, said separator and said recycling conduit;

(e) a fluidized-bed cooler receiving withdrawn solids from the last-mentioned means, said fluidized-bed cooler comprising:

a plurality of compartments traversed by the solids to be cooled in succession,

means for fluidizing the solids in each of said compartments,

respective cooling registers in contact with the solids in each of said compartments,

means for passing a coolant through said registers in succession and in a direction opposing the direction of movement of solids from compartment to compartment in said fluidized-bed cooler, and

means for feeding fluidizing gas, heated in said cooler, to said secondary gas inlet; and

(f) control means for feeding a proportion of cooled solids from said cooler to said reactor to maintain the temperature therein substantially constant.

4,111,159

RECOVERY OF HEAT FROM MOLTEN SLAG FROM METALLURGICAL PROCESSES

Ryuzo Okuno, Kobe; Hiroo Fujii, Kakogawa, and Keio Toyoda, Osaka, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 21, 1977, Ser. No. 779,600

Claims priority, application Japan, Mar. 24, 1976, 51-32980

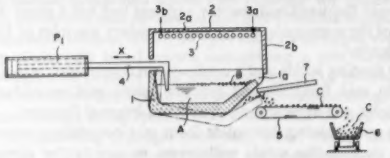
Int. Cl.[2] F22B *1/02*

U.S. Cl. 122—27 **9 Claims**

1. A method of recovering heat from slag from a metallurgi-

cal process, comprising the steps of placing a molten slag below radiant heat absorbing tubes, passing a fluid medium through the heat absorbing tubes, causing heat radiated by the molten slag and by subsequently solidified slag at high temperature to undergo transfer to the fluid medium and thereby to be recovered, and exposing the molten and solidified slags on the slag surface thereby to promote said transfer of heat.

8. Apparatus for recovering heat from slag from a metallurgical process, comprising: a plurality of vessels with open tops adapted to contain portions of the slag and disposed end-to-end in a circle; a plurality of trucks coupled end-to-end in said circle and each supporting a respective one of the vessels; rail



means laid out in said circle and supporting said trucks thereon; an annular cover structure for covering the tops of the vessels from above with a space formed therebetween; radiant heat absorbing means disposed in said space and communicating with piping outside the cover structure, a fluid medium being passed through the radiant heat absorbing means thereby to absorb heat radiated by the slag and transfer the heat to the heat absorbing means for utilization; and means for agitating the slag in each vessel thereby to remove any cooled slag layer from the upper surface of the slag and to stir the slag in molten state as well as in subsequently solidified condition at high temperature.

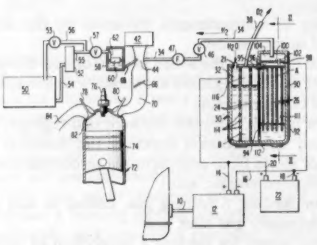
4,111,160
METHOD AND APPARATUS FOR OPERATING COMBUSTION ENGINES

Pier F. Talenti, 2100 Massachusetts Ave. NW., Washington, D.C. 20008

Continuation-in-part of Ser. No. 677,119, Apr. 16, 1976, abandoned, and a continuation-in-part of Ser. No. 734,475, Oct. 29, 1976, abandoned. This application Apr. 14, 1977, Ser. No. 787,651

Int. Cl.[2] F02B *43/08*

U.S. Cl. 123—1 A **7 Claims**



1. In an internal combustion engine having a carburetor, a gas generator cell adapted to receive an electrolytic solution and manifold means between said carburetor and said gas generator, the improvement comprising:

a separator dividing said cell into first and second compartments and having an opening therethrough providing communication between said compartments,

at least one cathode plate supported in said first compartment and shaped so that the incremental amount of active surface area exposed to the electrolyte by each successive incremental rise in the electrolyte in said first compartment is larger than the incremental amount of active surface area exposed to the electrolyte by the previous incremental rise in the electrolyte in said first compartment,

at least one anode plate disposed in said second compartment,

first means for applying an electric current to the circuit comprised of said anode plate, said cathode plate, and the electrolytic solution, to thereby produce hydrogen in said first compartment, and

second means to carry said hydrogen to said manifold means,

whereby when a back pressure is built in said manifold means and first compartment due to a production of hydrogen, the level of electrolyte in said first compartment is lowered and the surface area of said cathode plates exposed to said electrolyte is reduced to thereby reduce the production of hydrogen.

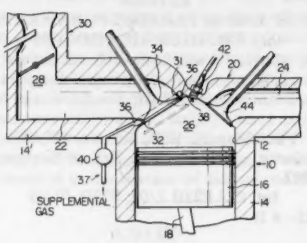
4,111,161
ENGINE OPERATED ON HYDROGEN-SUPPLEMENTED FUEL

Zene Ueno, Fuchu; Akira Morita, Tokyo; Shigeo Iwaki, Akishima; Tadahiko Nagaoka, Tokorozawa, and Tokuich Inagaki, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Oct. 22, 1975, Ser. No. 624,921

Int. Cl.[2] F02B *43/08*

U.S. Cl. 123—3 **4 Claims**



1. An internal combustion engine having a combustion chamber defined between a surface of a cylinder head and a piston, comprising:

lean air-fuel mixture supply means for supplying air-fuel mixture leaner than stoichiometric into the combustion chamber through an intake port formed in the cylinder head;

means for defining an annular hydrogen gas supply passage in the cylinder head, said hydrogen gas supply passage being formed annularly around an intake valve seat secured to the cylinder head and communicable with the intake port through the surface of the intake valve seat;

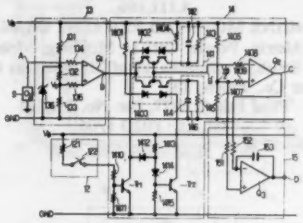
a hydrogen gas source operatively connected to said annular hydrogen gas supply passage; and

a spark plug disposed through the cylinder head and in the combustion chamber, said spark plug being located adjacent the wall surface of the cylinder head defining the combustion chamber.

4,111,162
METHOD AND SYSTEM FOR CONTROLLING THE MIXTURE AIR-TO-FUEL RATIO

Hideaki Norimatsu; Akio Kobayashi; Akira Masuda, and Sigenori Kitajima, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 27, 1976, Ser. No. 690,628
Claims priority, application Japan, Jun. 10, 1975, 50-70296; Jun. 17, 1975, 50-73969
Int. Cl.² F02B 3/00
U.S. Cl. 123—32 EE 2 Claims



1. An air-to-fuel ratio control system for an internal combustion engine comprising:

mixture supply means, provided in an intake passage of an engine, for supplying an air-fuel mixture thereto;

oxygen responsive means, provided in an exhaust passage of said engine, for producing a detection signal which changes the signal level thereof to indicate the absence and the presence of oxygen in said exhaust passage;

integration means, connected between said oxygen responsive means and said mixture supply means, for producing an integration signal changing in increasing and decreasing directions in response to the level of said detection signal to thereby correct the mixture air-to-fuel ratio, said integration means being adapted to change the signal level of said integration signal at a constant speed;

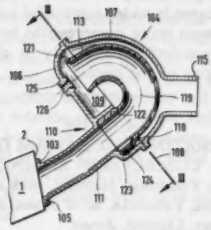
throttle condition detection means, coupled to the throttle valve of said engine, for producing a condition signal when said throttle valve is opened from the fully closed angle; and

integration control means, connected between said oxygen responsive means and said integration means and responsive to said throttle condition detection means, for controlling said detection signal prior to the integration thereof in response to said condition signal such that the changing rate of said integration signal with respect to the duration of said detection signal is made different between said increasing and decreasing directions, whereby the mixture air-to-fuel ratio is changed from a first ratio to a second ratio when said throttle valve is opened from the fully closed angle, said integration control means including a first delay circuit for delaying one of the signal levels of said detection signal by a predetermined time while said condition signal is generated such that the integration in one direction between said increasing and decreasing directions is kept further during said predetermined time, and a second delay circuit for delaying the other of the signal levels of said detection signal by another predetermined time while said condition signal is not generated such that the integration in the other direction between said increasing and decreasing directions is kept further during said another predetermined time.

4,111,163
AIR INDUCTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Georg Ederer, Munich; Adolf Fischer, Haar am Jagdfeld; Paul Rosche; Helmar Troll, both of Munich; Wolfgang Wurst, Dachau; Helmut Hengl, and Jiří Seidl, both of Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany

Filed Jul. 22, 1975, Ser. No. 598,086
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1975, 2501305
Int. Cl.² F02B 75/18
U.S. Cl. 123—52 M 9 Claims

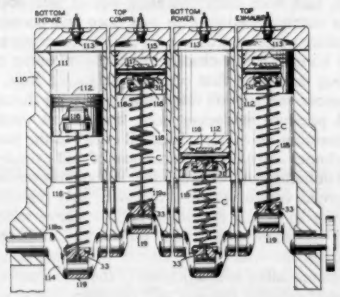


1. In combination, an internal combustion engine and an air induction system therefor, said air induction system having an air inlet opening, a distributor housing, and a plurality of induction passages, said induction passages having their respective inlets disposed in the distributor housing and respective outlets for connection to respective inlet ports of the engine, each induction passage consisting of a first portion and a second portion in series between the inlet and the outlet thereof, the first portion defining said inlet and the second portion defining said outlet, the distributor housing comprising a first pressure die cast part which defines said second portions of the induction passages, and a second part in which said air inlet is formed and which is joined to said first part to form said distributor housing therewith, and said indirection system further including a plurality of further parts defining the first portions of said induction passages respectively, and each of said further parts being curved and consisting of a separate member mounted on said first pressure die cast part.

4,111,164
VARIABLE DISPLACEMENT ARRANGEMENT IN FOUR CYCLE, RECIPROCATING INTERNAL COMBUSTION ENGINE

Robert P. Wuerfel, 4620 NW. 45 Ct., Ft. Lauderdale, Fla. 33319

Filed Sep. 27, 1977, Ser. No. 837,030
Int. Cl.² F02B 75/04
U.S. Cl. 123—78 E 7 Claims



1. In a four cycle, reciprocating, internal combustion engine

having a cylinder, a piston reciprocable in said cylinder, means for introducing a fuel mixture into the cylinder, means for igniting the fuel mixture, means for exhausting the burned gases from the cylinder, an engine crankshaft, and compression spring means acting between said piston and said crankshaft to cause crankshaft rotation in response to piston reciprocation, the improvement which comprises:

means limiting the expansion of said spring means to compress the latter with a force at least substantially equal to the piston force required to compress the fuel mixture in the cylinder for proper combustion when the engine is under substantially no load, whereby said spring means provides a substantially stiff coupling between the piston and the crankshaft when the engine is under substantially no load and provides a resiliently compressible coupling when the engine is under substantial load;

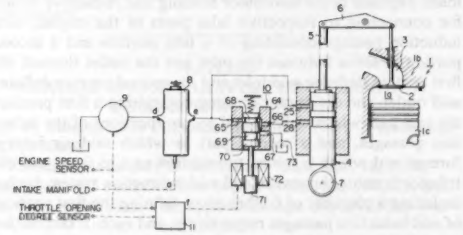
said spring means being compressible between said piston and said crankshaft substantially in proportion to said substantial load on the engine.

4,111,165

VALVE OPERATING MECHANISM OF INTERNAL COMBUSTION ENGINE

Syuniti Aoyama; Yoshimasa Hayashi, both of Yokohama, and Yasuo Nakajima, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jul. 2, 1976, Ser. No. 702,073
Claims priority, application Japan, Jul. 5, 1975, 50-82897
Int. Cl.[2] F01L *1/34*
U.S. Cl. 123—90.15 **20 Claims**



1. A valve operating mechanism of an internal combustion engine having engine operating valve, comprising:

pressure regulator means for regulating the pressure of oil delivered from an oil source under pressure in response to engine load, said pressure regulator means including a cylindrical body having adjacent its one end an axially extending first cylindrical chamber, and adjacent its other end an axially extending second cylindrical chamber, an axially extending bore through which said first and second cylindrical chambers communicate, the diameter of said bore being smaller than that of said first and second chambers, said bore communicating out of said body, an oil inlet communicating with said bore and connected to a pressurized oil source, an oil outlet communicating with said bore, said first chamber and said oil outlet communicating through a first pressure balancing hole, said first chamber and said oil inlet communicating through a second pressure balancing hole, and an oil vent opening connecting the inside of said oil outlet to the atmosphere, a cylinder cap closing the one end of said cylindrical body and defining said first chamber, a regulator piston slidably disposed within said first chamber, said regulator piston having an axially extending hollow sleeve which is slidably disposed within said bore and has holes formed through the wall of said sleeve, the inside of said sleeve communicating with a portion of the first chamber defined by said cylinder cap and said regulator piston within said bore and communicating with said oil inlet and said oil outlet through said holes of said sleeve, a first spring disposed between said cylinder cap and said regulator piston, an axially extending cylindrical switch piston slidably disposed within said sleeve, said switch piston having an axially extending central opening communicating the inside of said sleeve with said bore and a ring groove which is alignable with said holes of said sleeve, and means for moving said switch piston in response to the engine load; and

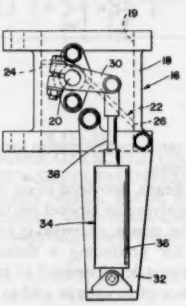
valve lifter means for operating the engine operating valve and capable of changing the valve lift and the valve timing of the engine operating valve in response to the pressure of the oil introduced therein from said pressure regulator means.

4,111,166

ENGINE MOUNTED EXHAUST BRAKE

Charles E. Alstrin, Peoria; Carl L. McClung, Metamora, and James C. Smith, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 7, 1977, Ser. No. 766,314
Int. Cl.[2] F02D *9/06*
U.S. Cl. 123—97 B **4 Claims**



1. Exhaust brake apparatus for an internal combustion engine including an exhaust line, wherein exhaust back pressure is to be limited to a certain level, comprising a damper movably mounted within said exhaust line, means operable by air pressure for moving said damper to its closed position, the damper having a first planar portion and a smaller second planar portion bent at an obtuse angle from said first planar portion in the direction of flow in the exhaust line, the damper further including a shaft portioned adjacent said second planar portion such that said shaft is offset from the centerline of the exhaust line, so that with a generally operable level of air pressure applied to the means operated by air pressure, the damper opens under a certain level of exhaust back pressure.

4,111,167

CARBURETOR BY-PASS

Earl Conley, Salmon Arm, Canada, assignor to Cyril Cecil Kane, Salmon Arm, Canada, a part interest

Filed Oct. 14, 1976, Ser. No. 732,326
Claims priority, application Canada, Sep. 3, 1976, 260459
Int. Cl.[2] F02D *11/10*
U.S. Cl. 123—102 **8 Claims**

1. An air by-pass device for internal combustion engines comprising:

a first valve assembly adapted to be sealingly mounted between a carburetor assembly and the engine intake manifold, said valve assembly including a housing having a passageway extending therethrough providing fluid communication between said carburetor and said manifold, and a valve member operable to move between open and and substantially closed positions in said passageway,

means for conveying ambient air to said intake manifold through said first valve assembly,

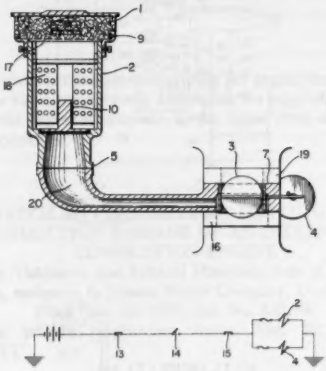
a second valve assembly operatively connected with said air conveying means for controlling the flow of air therein,

first and second solenoids for operating respectively said first and second valve assemblies simultaneously,

an electric line for connecting said first and second solenoids with a source of electric current,

a normally closed manual switch in said electric line capable of interrupting the electric current,

a switch member in said electric line and interconnected with the accelerator such that said switch is open when



the accelerator pedal is depressed and closed when the accelerator pedal is released to idle position,

a sail switch in said electric line and positioned in the flow of air from the engine cooling fan and adjusted so as to be closed when the air flow from the fan exceeds the normal flow at idle and open when the air flow equals the normal flow at idle,

whereby when said accelerator pedal is released at a time when the air flow from the engine cooling fan exceeds normal flow at idle, said first and second solenoids will be energized for closing said first valve assembly and cutting off fuel flow to the engine and opening said second valve assembly for admitting ambient air to the engine.

4,111,168

IGNITION DISTRIBUTOR-CIRCUIT BREAKER ASSEMBLY FOR INTERNAL COMBUSTION ENGINES

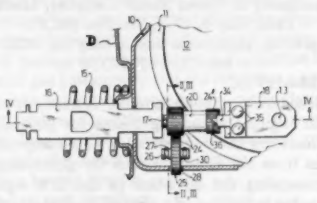
Karl Ehrmann; Richard Gerber, both of Stuttgart, and Klaus Doderer, Neuenburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 24, 1976, Ser. No. 669,836

Claims priority, application Fed. Rep. of Germany, May 28, 1975, 2523638

Int. Cl.² F02P 5/00

U.S. Cl. 123—117 A **8 Claims**



1. Ignition distributor and circuit breaker assembly for internal combustion engines having a housing (10);

a slit (28) formed in the housing;

a breaker support plate (12) mounted in the housing for limited rotation therein to support a breaker assembly;

and means (15) controlling the position of the support plate (12) in the housing including a link means (16, 17, 18, 19, 20) the length of which is adjustable, connecting said position control means (15) to the plate (12), wherein

said link means comprises a first end element (16, 17) having a left-hand thread, and a second end element (18, 19) having a right-hand thread, and a rotatable coupling sleeve (20, 20') having left hand threads and right-hand threads at opposite end portions in threaded engagement with the respective end elements and formed, externally, with cylindrical shape and a serrated or gear-shaped outer surface

a rotation-transmitting disk-shaped element (25) penetrating in part through said slit (28) in the housing and accessible externally from said housing said disk being formed with a serrated, gear-shaped circumference and located for coupling engagement with respect to said rotatable sleeve (20) to permit rotation of said sleeve and thereby adjust the effective length of said link means and hence the position of said plate (12) in the housing with respect to said position control means (15);

a central shaft (26) extending from both sides of said disk-shaped element;

a pair of spring clips located in said housing, shaped to engage at least in part around said central shaft (26), the spring clips securing said disk shaped element member in axially fixed, but laterally movable position within said housing;

said slit being of lesser size than the diameter of the disk-shaped element, the spring clips locating said rotation transmitting member in position out of engagement with the sleeve and closing off said slit (28) but permitting inward movement of said disk shaped element and engagement with the serrated or gear-shaped circumference of said sleeve.

4,111,169

SPARK IGNITION INTERNAL COMBUSTION ENGINES

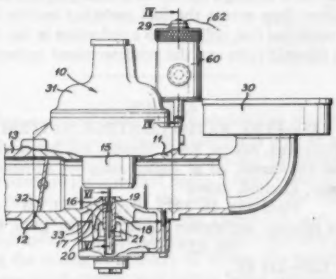
Geoffrey Lloyd Lawrence, Stanmore, England, assignor to The Zenith Carburetter Company Limited, Stanmore, England

Filed Dec. 30, 1975, Ser. No. 645,394

Claims priority, application United Kingdom, Dec. 31, 1974, 56185/74

Int. Cl.² F02H 7/00

U.S. Cl. 123—119 EC **12 Claims**



1. A spark ignition internal combustion engine installation which comprises a carburetor of the air valve type and an exhaust system; the carburetor having a body in which an induction passage is formed, the induction passage providing a flow path for air which is drawn into the engine by operation of the engine, a driver operable throttle valve for controlling the mass flow of air through the induction passage, an air valve upstream of the driver operable throttle valve, the air valve cooperating with a wall portion of the induction passage to

form a throat of restricted dimensions and being controlled by the depression that is established in that part of the induction passage between the throttle valve and the air valve in order to vary the area of the throat and maintain that depression substantially constant, and only one fuel supply system for supplying metered quantities of fuel to that part of the induction passage between the throttle valve and the air valve, said fuel supply system comprising a fuel metering section, a fuel discharge nozzle and a source of liquid fuel and being arranged so that metered quantities of liquid fuel are drawn from said source through the fuel metering section and the fuel discharge nozzle into the induction passage by air flow through said throat whereby fuel drawn through the discharge nozzle is atomized and dispersed within that part of the induction passage between the throat and the throttle valve so as to mix with air that flows through said throat and to form an air/fuel mixture which flows to the engine; the engine installation also including sensing means which are operable to monitor the ratio between the quantity of one of the constituents of gas flow at a location downstream of the throttle valve and the remainder of that gas flow and to emit a signal when that ratio differs from a predetermined optimum ratio by a predetermined amount, that signal being indicative of the sense of the difference between the ratio that is sensed at any one instant and the predetermined optimum ratio, an air flow passage which is connected to the fuel supply system between the fuel metering section and the fuel discharge nozzle, variable air flow metering means for metering air flow through the air flow passage so that metered quantities of air are drawn into the fuel supply system upstream of the fuel discharge nozzle and are mixed therein with fuel that is drawn through the fuel metering section so that a mixture of metered quantities of fuel and air is drawn through the fuel discharge nozzle into the induction passage by air flow through the throat, the quantity of air drawn from the air flow passage into the fuel supply system upstream of the fuel discharge nozzle being metered by the variable air flow metering means, varying means which are operable to vary the performance of the air flow metering means, and signal transmitting means connected to the varying means and the sensing means so as to transmit to the varying means the signal that is emitted by the sensing means, the varying means being operable in response to a signal received from the sensing means to vary the performance of the air flow metering means so that the pressure drop across the fuel metering section is varied by the consequent change in the air flow through said air flow passage with the result that the quantity of fuel drawn from the source through the fuel metering section and the fuel discharge nozzle into the induction passage by a given air flow through the throat is changed, the variation in the pressure drop across the fuel metering section being the form of variation that will lead to a reduction in the difference between the said ratio and the predetermined optimum ratio.

4,111,170

AIR-FUEL RATIO CONTROL SYSTEM

Masao Nakajima, Atsugi; Kenji Masaki, and Mitsumasa Inoue, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jan. 26, 1977, Ser. No. 762,720

Claims priority, application Japan, Jan. 30, 1976, 51-9031

Int. Cl.[2] F02B *33/00*

U.S. Cl. 123—119 EC **17 Claims**

1. An air-fuel ratio control system for an internal combustion engine, comprising

means for sensing the concentration of a component contained in exhaust gas of said engine which concentration is representative of a function of the air-fuel ratio of an air-fuel mixture burned in said engine, said sensing means having

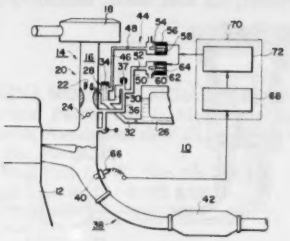
means for generating an output signal representative of the sensed concentration of said component;

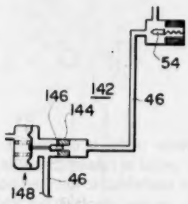
means defining a first passage communicating with the atmosphere and causing atmospheric air to be drawn into a main fuel passage of a main system of a carburetor of said engine;

a first flow control valve for controlling the flow of atmospheric air drawn into said main fuel passage through said first passage;

means defining a second passage communicating with the atmosphere and causing atmospheric air to be drawn into a slow fuel passage of a slow system of said carburetor;

a second flow control valve for controlling the flow of atmospheric air drawn into said slow fuel passage through said second passage;





first control means causing, in accordance with said output signal of said sensing means, said first and second flow control valves to vary the flow of air drawn into said main and slow fuel passages through said first and second passages to adjust the flow of fuel drawn from said main and slow fuel passages into said intake passageway to adjust the air-fuel ratios of air-fuel mixtures formed by said main and slow systems to a desired air-fuel ratio, respectively; and

air flow control means cooperating with said first passage and for preventing the flow of air drawn into said main fuel passage through said first passage from being undesirably increased with increases in the load of said engine.

4,111,171

CLOSED-LOOP MIXTURE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE USING SAMPLE-AND-HOLD CIRCUITS

Shigeo Aono, Tokyo, and Masaharu Asano, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 6, 1976, Ser. No. 683,670

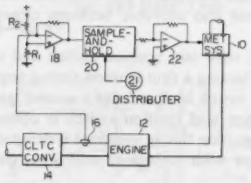
Claims priority, application Japan, May 12, 1975, 50-54613

Int. Cl.[2] F02M *7/00*

U.S. Cl. 123—119 EC **12 Claims**

1. A closed-loop mixture control system for an internal combustion engine, comprising means for generating a first signal representing the concentration of a composition of exhaust gases from the engine, means for generating a second signal representing the deviation of the first signal from a reference value indicative of a desired air-fuel ratio, means for sampling the second signal at intervals, means for holding the sampled signal until the next sampling occurs, means for storing the signal from said holding means along a row of storage

elements from one element to another in step with the occurrence of said sampling, a weighting network for respectively multiplying the stored signals by constant values of different magnitude, means for providing summation of the weighted



signals, and a proportional controller for amplifying the signal from the summation means, and means for supplying the mixture to the engine in response to the signal from said proportional controller.

4,111,172
SYSTEM TO FEED EXHAUST GAS INTO THE INDUCTION PASSAGE OF AN INTERNAL COMBUSTION ENGINE

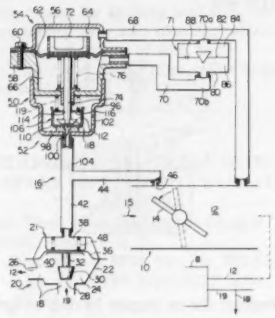
Mamoru Nishizawa, and Takashi Hisatomi, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 26, 1975, Ser. No. 635,700

Claims priority, application Japan, Nov. 30, 1974, 49-143810[U]

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **11 Claims**



1. An exhaust gas recirculation control system in combination with an internal combustion engine including

an induction passageway providing communication between the atmosphere and the engine for conducting air thereinto,

a throttle valve rotatably mounted in the induction passageway, and

an exhaust gas passageway providing communication between the engine and the atmosphere for conducting thereto exhaust gases emitted from the engine, said exhaust gas recirculation (EGR) control system comprising

an EGR passageway providing communication between the exhaust gas passageway and the induction passageway for recirculating exhaust gases of the engine thereinto,

an EGR control valve disposed in said EGR passageway for controlling the flow rate of engine exhaust gases recirculated into the induction passageway,

a housing having therein

first and second chambers,

a flexible diaphragm separating said first and second chambers from each others,

first passage means communicating at one end with the induction passageway downstream of the throttle valve and at the other end with said first chamber,

second passage means communicating at one end with said first passage means and at the other end with said second chamber,

a pressure insensitive partition located in said second passage means to divide same into first and second sections which communicate respectively with said first passage means and said second chamber, said partition being unmovable by a pressure differential between said first and second sections, said partition being formed therethrough with an orifice and an aperture each of which provides communication between said first and second sections,

a check valve for closing said aperture in response to a vacuum in said first section which is below the vacuum in said second section for reducing the vacuum in said second chamber with a time lag when the vacuum in said first chamber is reduced and for opening said aperture in response to a vacuum in said first section which is above the vacuum in said second section for increasing the vacuum in said second chamber without a time lag when the vacuum in said first chamber is increased, and

operating means for causing said EGR control valve to open said EGR passageway and to control the flow rate of recirculated engine exhaust gases in response to the vacuum in said second chamber which is reduced with said time lag and for causing said EGR control valve to close said EGR passageway to prevent the recirculation of engine exhaust gases into the induction passageway in response to the vacuum in said second chamber which is increased without said time lag.

4,111,173
FUEL PUMPING APPARATUS

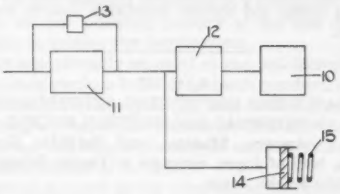
Robert Thomas John Skinner, High Wycombe, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 3, 1977, Ser. No. 774,123

Claims priority, application United Kingdom, Mar. 10, 1976, 9446/76

Int. Cl.[2] F02M *63/00*

U.S. Cl. 123—139 AQ **6 Claims**



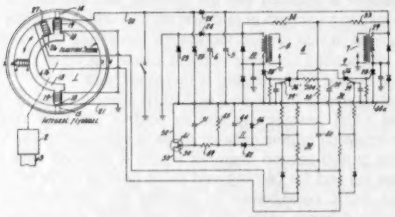
1. A fuel pumping apparatus comprising an injection pump which in use is driven in timed relationship with an associated engine, means including a fuel feed pump for supplying fuel under pressure to the injection pump, a relief valve for controlling the output pressure of the feed pump, said relief valve being located in a line operatively connected with said feed pump, and means including a fuel pressure operable piston for adjusting the timing of delivery of fuel by the injection pump to the associated engine, said piston being responsive to the output pressure of the feed pump, said relief valve comprising a first resiliently loaded valve element which is subjected to the output pressure of the feed pump; an orifice and a spill port located downstream of said first valve element, said first valve element when the pressure rises to a predetermined value opens to allow fuel flow through said orifice, a second resiliently loaded valve element subjected to the intermediate pressure of fuel between the first valve element and the orifice, said second valve element when subjected to said intermediate pressure acting to reduce the resilient loading on the first valve

element, said second valve element acting to control the size of said spill port which is in parallel with said orifice and which starts to open when the second valve element has been moved a predetermined extent by the intermediate pressure, said second valve element having a greater area exposed to said intermediate pressure than the area of the first valve element which is exposed to the output pressure of the feed pump.

4,111,174
IGNITION SYSTEM WITH IDLE SPEED GOVERNOR APPARATUS

Arthur O. Fitzner, and Richard L. Sleder, both of Fond du Lac, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jan. 4, 1977, Ser. No. 756,649
Int. Cl.[2] F02P 1/00, 5/04
U.S. Cl. 123—148 CC **18 Claims**

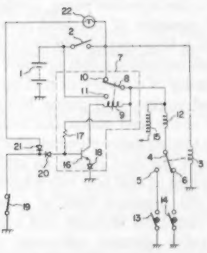


1. An ignition system for an internal combustion engine, comprising a solid state ignition circuit having a firing pulse source and output means adapted to be connected to the firing means of an internal combustion engine, said ignition circuit having a speed sensitive timing characteristic including retarded timing below a selected operating speed, said output means includes a gated switch means connected to said pulse source and to the firing means, a trigger pulse source means connected to the gated switch means for periodically actuating said switch means, and a speed sensing means connected to said solid state ignition circuit and including control means connected to said gated switch means and said trigger pulse source means and responsive to speed below said selected operating speed to electronically advance said timing characteristic to an advanced timing and thereby establish a smooth low speed operation.

4,111,175
APPARATUS FOR PREVENTING AFTERBURNING IN AN INTERNAL COMBUSTION ENGINE

Norihiko Nakamura, Mishima, and Takahide Kawamura, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jun. 7, 1976, Ser. No. 693,626
Claims priority, application Japan, Oct. 29, 1975, 50-129365; Feb. 4, 1976, 51-010261
Int. Cl.[2] F02B 77/00
U.S. Cl. 123—198 DC **10 Claims**



1. Apparatus for substantially preventing afterburning of unburnt combustion products in an internal combustion engine having a source of electrical energy and an ignition circuit for generating high voltage pulses coupled to said electrical energy source, said apparatus comprising:

an ignition switch interposed between said source and said ignition circuit and movable between closed and open positions;

means coupled with said ignition switch and said ignition circuit for selecting a first ignition timing sequence when said ignition switch is closed and a second ignition timing sequence when said ignition switch is opened, wherein said second ignition timing sequence is delayed a predetermined amount with respect to said first ignition timing sequence;

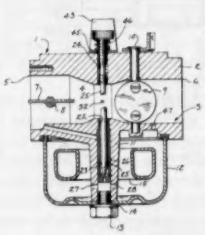
means for detecting an engine operating parameter directly related to the rotational speed of said engine; and

means coupled with said detecting means, said ignition circuit and said energy source for maintaining a closed circuit between said ignition circuit and said energy source during said second timing sequence until said engine operating parameter reaches a predetermined value, and thereafter opening said closed circuit to prevent further ignition pulses from being generated by said ignition circuit.

4,111,176
ENGINE SHUTDOWN CONTROL

Alvin P. Fenton, Oostburg; Roger T. Gault, Sheboygan Falls, and Lawrence J. Bernauer, Kohler, all of Wis., assignors to Kohler Co., Kohler, Wis.

Filed May 11, 1977, Ser. No. 795,784
Int. Cl.[2] F02B 77/08
U.S. Cl. 123—198 DB **4 Claims**

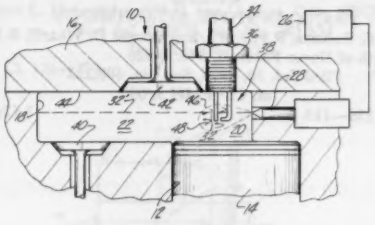


1. In a carburetor for an engine having an ignition which carburetor includes an air passage adapted for connection to an engine intake manifold, a venturi constriction in said air passage, a float bowl and a discharge nozzle leading from the float bowl and adapted to deliver fuel into the venturi constriction, the improvement which comprises means for preventing dieseling which can occur when fuel continues to flow from the discharge nozzle when the ignition is turned off, which means includes a bowl vent passage communicating between the float bowl and a position at atmospheric pressure, valve means for opening and closing the bowl vent passage, said valve means being open when the ignition is on so that the float bowl is exposed to atmospheric pressure which causes fuel to flow from the float bowl through the nozzle of the venturi and closed when the ignition is off so the float bowl is not exposed to atmospheric pressure and pressure equalizing means which connects the venturi constriction to the float bowl, said pressure equalizing means including a duct which is small enough in diameter so as to not interfere with the normal functioning of the bowl vent passage when the valve means is open but large enough to equalize the pressure between the venturi constriction and the float bowl when the valve means is closed so that fuel will not flow through the nozzle to the venturi constriction to support dieseling.

4,111,177
INTERNAL COMBUSTION ENGINE

Jose F. Regueiro, Muskegon, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Sep. 30, 1976, Ser. No. 728,068
Int. Cl.[2] F02B 3/00
U.S. Cl. 123—32 ST 8 Claims



1. In a internal combustion engine having a cylinder, a piston reciprocally disposed in said cylinder, and a head secured over said cylinder, the improvement which comprises:

a wall portion in said head, said wall portion forming a chamber above said cylinder and an air pocket adjacent said chamber and radially beyond the projected boundaries of said cylinder said wall portion providing an unrestricted communication between said combustion chamber and said air pocket at every position of said piston,

fuel injection means having a nozzle for directing a stream of fuel through said chamber and into said air pocket in a direction substantially perpendicular to the movement of said piston,

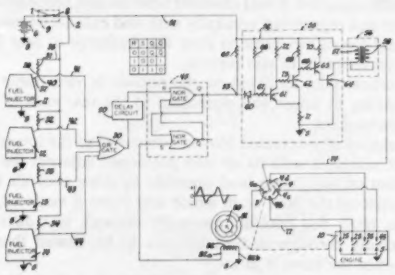
fuel ignition means for igniting said fuel, said fuel ignition means extending into said chamber substantially in the trajectory of said stream of fuel, and

an exhaust valve and an air inlet valve in communication with said wall portion.

4,111,178
IGNITION SYSTEM FOR USE WITH FUEL INJECTED-SPARK IGNITED INTERNAL COMBUSTION ENGINES

Gary L. Casey, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1976, Ser. No. 739,563
Int. Cl.[2] F02B 3/00; F02P 5/04
U.S. Cl. 123—32 SA 4 Claims

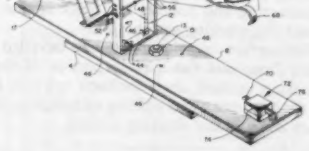


1. An ignition system for use with direct fuel injected spark ignited internal combustion engines of the type having a spark igniting device for each cylinder thereof, comprising: a fuel injector having a valve seat and a cooperating movable valve member corresponding to each cylinder of an associated internal combustion engine for injecting fuel into the combustion chamber of the said cylinder to which it corresponds when said movable member is actuated, said valve seat and cooperating movable valve member providing a pair of normally closed electrical contacts which are operated to the electrical circuit open condition upon the initiation of actuation of said movable valve member to inject fuel; means including said pair of normally closed contacts for producing an electrical signal corresponding to each said fuel injector upon the operation of said pair of normally closed electrical contacts thereof to the electrical circuit open condition; circuit means including delay circuit means responsive to each of said electrical signals for producing an ignition spark creating voltage; and means for directing said ignition spark creating voltage to the said spark igniting device of the said cylinder of said engine into which fuel is being injected.

4,111,179
CATAPULT TOY

Hideo Hashimoto, 2618 Desert St., P.O. Box 1182, Rosamond, Calif. 93560

Filed Apr. 7, 1977, Ser. No. 785,686
Int. Cl.[2] F41B 3/02, 7/00
U.S. Cl. 124—7 6 Claims



1. A catapult toy comprising

a mounting platform,

a pair of arch members positioned in a contiguous relationship on said mounting platform at one end thereof to define an arching slot therebetween,

a pivot arm pivotally mounted at one end thereof on said mounting platform between said arch members, said pivot arm being movable generally in a vertical plane in said arching slot between a latched position and a stop position, and including a plurality of notches located on the underneath side of the arm,

cup means disposed on the other end of said pivot arm for carrying a projectile therein,

stop means disposed on said arch members to extend therebetween across said arching slot above said pivot arm for stopping upward movement of the arm, said stop mens being positionable at different locations along the arching slot to thereby stop the upward movement of the arm at different elevations of the arm,

a pair of upright standards mounted on said mounting platform on each side of the vertical plane in which said pivot arm moves,

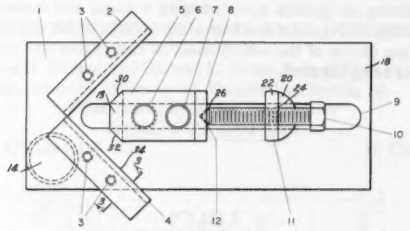
an elastic band extending between said standards underneath said pivot arm to contact and urge the arm upwardly when the band is stretched by downward movement of the arm against the band, said band being positionable in various ones of the notches of said pivot arm to thereby vary the force applied by the band to the arm, and

latch means for releasably latching the pivot arm in a latched position in which the band is stretched downwardly by the arm, said pivot arm being propelled upwardly by said band when released by the latch means.

4,111,180
ROCK HOLDING DEVICE

Edward Verle Goodrich, 4735 W. 35th Ave., Denver, Colo. 80212

Filed Sep. 23, 1977, Ser. No. 836,083
Int. Cl.[2] B25B 5/14
U.S. Cl. 125—35 8 Claims

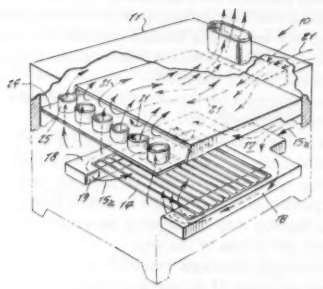


1. A rock-holding device comprising:
a mounting plate having a longitudinal axis and having a flat surface portion for contacting a rock;
a pair of bars mounted on said mounting plate, said bars being mounted at one angle to each other;
a fixably mountable finger slidably adjustable in a line approximately parallel to said longitudinal axis;
a pair of planar surfaces, one on each of said bars, said surfaces extending from said flat surface portion of the mounting plate at an inclined angle towards said finger, for contacting and holding said rock against said finger and said flat working surface; and
a bevelled surface on said finger, said bevelled surface extending from said flat surface portion of the mounting plate at an upward angle inclined towards said pair of bars, for contacting and holding said rock against said pair of bars and said flat working surface.

4,111,181
COMBUSTION AIR SYSTEM

John J. Canney, 82 Falcon St., Needham, Mass. 02192

Filed Mar. 16, 1977, Ser. No. 778,165
Int. Cl.[2] F24C 1/14
U.S. Cl. 126—77 3 Claims

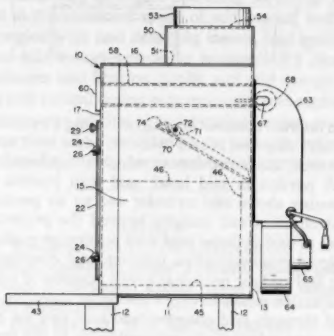


1. A combustion air system, comprising in combination, a furnace or the like having an air-tight combustion chamber, a grate above a combustion chamber floor, said grate supporting wood for being burned, a plurality of air tubes below said grate supplying primary air therethrough and into said air-tight combustion chamber by pre-heating said primary air, air outlets along said tubes directing said primary air to an underside of said grate and to said wood; an air conducting tube in a crown sheet of said combustion chamber being located above said burning wood, said air conducting tube in said crown sheet introducing secondary air at an outlet of said tube and adjacent a plurality of nozzles or pipes communicating through said crown sheet and with said combustion chamber containing said wood, whereby volatile gases from said chamber through said nozzles mixes with said secondary air and is ignited, creating additional heat above a smoke shelf prior to passing out a smoke outlet.

4,111,182
FRANKLIN STOVE ATTACHMENTS

Herbert E. Roberts, R.F.D. #3, and Donald D. Wharff, R.F.D. #2, both of Dover-Foxcroft, Me. 04426

Filed Jul. 30, 1975, Ser. No. 600,222
Int. Cl.[2] F24H 3/08
U.S. Cl. 126—110 B 3 Claims



1. A stove, comprising
a frame having therein a combustion chamber,
at least one door movably mounted on the front wall of said frame over an access opening which communicates with said chamber selectively for inserting fuel into, and for withdrawing ashes from said chamber,
a plenum mounted on top of said frame for connection to a flue, and communicating with said chamber through an exhaust opening formed in the top of said frame adjacent the rear wall thereof,
a plurality of spaced, tubular heat exchangers extending through said combustion chamber adjacent the upper end thereof, and opening at their forward ends on a further opening formed in said front wall of said frame above said access opening, and opening at their rear ends in registering openings formed in the rear wall of said frame,
a baffle mounted in said chamber beneath said heat exchangers and registering vertically with said exhaust opening in said top of the frame to slow the discharge of heat from said chamber to said plenum,
a vertical duct mounted on the outside of said frame and having its upper end connected to the rear ends of said exchangers,
an electrically-operated blower connected to the lower end of said duct with its air inlet positioned adjacent the bottom of said frame, and operable to draw cool air from adjacent the floor upon which said frame is mounted, and to blow this cool air upwardly through said duct and axially through said exchangers to be heated thereby, when the stove is in use,
a first layer of refractory material covering the bottom of said frame in said chamber, and
a further layer of refractory material covering the inside of said chamber between said first layer and baffle, said further layer having an opening therein registering with said access opening in said front wall of the frame,
said baffle comprising a plate removably mounted in said chamber and having its rear edge positioned adjacent the rear wall of said frame above said further layer of refractory metal, and extending diagonally forwardly and up-

wardly part way toward said front wall and the undersides of said heat exchangers, and

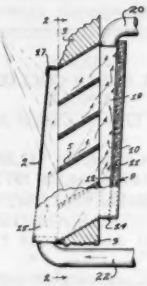
the opening formed between said front wall and the forward edge of said plate being offset horizontally from said exhaust opening in the top of said frame.

4,111,183

SOLAR HEATING UNIT

Wilbert L. Haberthier, 660 G Ave., Limon, Colo. 80828

Filed Jul. 1, 1976, Ser. No. 701,535
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **2 Claims**



1. A solar heating unit comprising:

a plurality of vertically stacked tubes, each having rectangular cross section and having sides defining a parallelogram in which one corner angle is less than 90° and having a heat reflective inside bottom surface, and wherein one end of each tube is disposed at a lower level than the other end;

an entry air chamber enclosing the said lower ends of the said tubes having transparent wall means and;

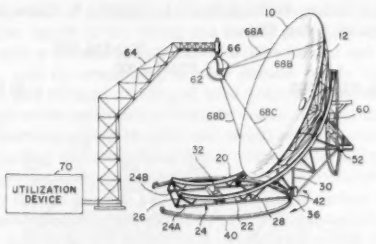
a heated air plenum enclosing the elevated ends of the tubes and comprising a heat absorbing non-reflective wall.

4,111,184

SUN TRACKING SOLAR ENERGY COLLECTOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Gerald S. Perkins, Altadena, Calif.

Filed Apr. 6, 1977, Ser. No. 785,257
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **8 Claims**



1. A sun tracking solar energy collector comprising:

azimuth framework means,

means supporting said azimuth framework means for horizontal rotation about a vertical axis,

a pair of arcuate rails, means supporting said arcuate rails at one end extending vertically from said azimuth framework means,

a parabolic reflector,

wheel means supporting said parabolic reflector on said arcuate pair of rails,

counter balance means for counter balancing the weight of said parabolic reflector,

first motor means coupled to said counter balance means for causing said parabolic reflector to assume different desired elevations, and

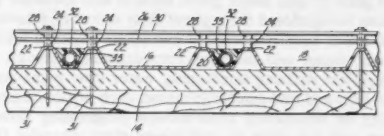
second motor means coupled to said means supporting said azimuth framework means for causing said azimuth framework means and therewith said parabolic reflector to assume predetermined azimuthal positions.

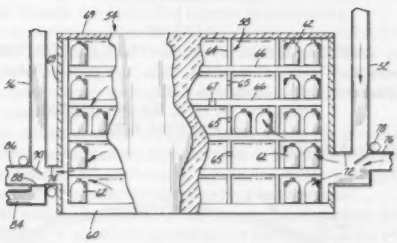
4,111,185

SOLAR HEATING SYSTEM

Frederick R. Swann, 5913 N. Bend Rd., Ashtabula, Ohio 44004

Filed Mar. 29, 1976, Ser. No. 671,282
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **7 Claims**





1. An improved solar heating panel assembly comprising solid panel means for collecting heat from the sun, air duct means formed in heat transfer relationship with said panel means, said panel means forming a part of said air duct means, means to permit air flow through said air duct means,

liquid conduit means in conductive heat transfer relationship with said panel means and surrounded at least in part by said air duct means, and means to flow liquid through said conduit means, and closed loop heat transfer means connected to said liquid conduit means,

whereby either the air heat transfer system or the liquid heat transfer system can be utilized separately or concomitantly.

3. The invention as defined in claim 2 wherein said rack and shelf structure includes aperature means to promote air flow.

4,111,186

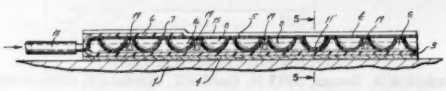
FLAT PLATE SOLAR COLLECTOR

Donald K. Ross, No. 9 Crosswinds, St. Louis County, Mo. 63132, and Wallace A. Wright, Jr., 189 Tolley Square, Salt Lake City, Utah 84102

Filed Jan. 24, 1977, Ser. No. 761,808
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **16 Claims**

1. A solar energy collector of non-rigid character for facile rolling upon itself when in disuse comprising a lower plate and a top plate in planar parallel relationship, means joining said lower and top plates in their side portions for defining an

interior chamber, said top plate being fabricated of relatively thin, durable, flexible transparent sheet material being transmissible to solar heat waves and substantially non-heat absorptive, said lower plate being of flexible, relatively thin sheet material and being heat-absorptive and impervious to water, said top plate having the property of substantially inhibiting the re-radiation therethrough of relatively long heat waves generated by said lower plate, means provided at one end of said chamber for water inlet, means provided at the opposite end of said chamber for heated water discharge, flexible, water-impervious means defining a plurality of insulator compart-



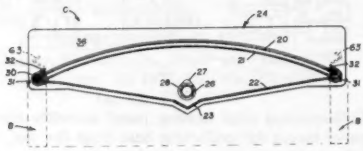
ments arranged within said chamber and extending from said top plate to said lower plate, each of said insulator compartments being closed throughout their extent and having upper and lower ends respectively immediate adjacent said top and lower plates, said insulator compartments through their arrangement defining intervening water flow paths connecting said inlet and said discharge means, each of said compartments being of decreasing cross-section progressing downwardly from said top plate to said lower plate whereby the upper portions of said compartments overlie portions of said flow paths thereby tending to insulate the water in said flow paths for minimizing development of air convection currents.

4,111,187

MODULAR SOLAR RADIATION COLLECTOR

James B. Wiegand, Longmont, Colo., assignor to Solar Energy Research Corp., Longmont, Colo.

Filed Jan. 17, 1977, Ser. No. 759,762
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **17 Claims**



1. In a modular collector unit for collecting radiant solar energy to heat fluid, such as water, adapted to be mounted at an inclination to better receive radiant solar rays and to permit gravity drainage of fluid from the bottom end of the unit when so inclined, comprising:

(a) an upper, outer radiation transmission surface;

(b) an intermediate radiation absorption surface which is spaced below the upper radiation transmission surface to define an upper cavity therebetween;

(c) a lower surface including a drainage pan which is spaced below the radiation absorption surface to define a lower cavity therebetween;

(d) a side connection means interconnecting the longitudinal inclined side edges of the upper, intermediate and lower surfaces;

(e) top and bottom end cap means interconnecting the transverse top and bottom ends of the upper, intermediate and lower inclined surfaces whereby the side connection means and top and bottom end cap means enclose the upper and lower cavities between the respective surfaces;

(f) a spray means longitudinally extended into the lower cavity to spray fluid against the underside of the radiation absorption surface; and

(g) a drainage outlet means at the bottom of the lower cavity, and wherein:

(1) the intermediate radiation absorption surface is transversely convexed and the drainage pan is transversely concaved, with the inclined side edges of the radiation absorption surface and the drainage pan coming together to form a longitudinal lens-shaped lower cavity with the space between the radiation absorption surface and the drainage pan being sufficient to permit the spray means in the lower cavity to spray fluid against substantially the entire undersurface of the radiation absorption surface; and

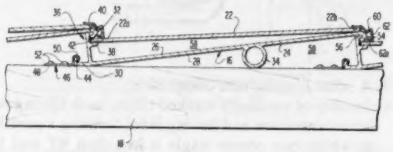
(2) said spray means comprises an elongated, fluid-feed tube extending from the top end cap means and longitudinally through the lower cavity to a point near the bottom end cap means with nozzles spaced along the tube directed against the underside of said radiation absorption surface.

4,111,188

EXTRUDED METAL SOLAR COLLECTOR ROOFING SHINGLE

John A. Murphy, Jr., 7273 N. Central Ave., Phoenix, Ariz. 85020

Continuation-in-part of Ser. No. 712,291, Apr. 6, 1976, abandoned. This application Aug. 24, 1977, Ser. No. 827,617
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **16 Claims**



1. An extruded metal solar collector roofing shingle for mounting in multiple shingle, edge overlapping, parallel array fashion across laterally spaced inclined roof rafters of a building structure or the like, said shingle comprising:

an elongated planar sheet portion, having upper and lower surfaces and laterally opposed upper and lower edges, said upper surface facing away from the building,

integrally extruded fluid conduit means within said sheet portion and protruding from said lower surface, and

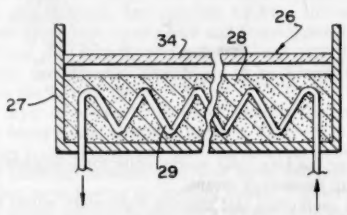
integrally extruded interlocking means along opposed lateral edges of said sheet portion for forming a mechanical interlocking connection between overlapping edges of respective sheet portions of adjacent shingles.

4,111,189

COMBINED SOLAR RADIATION COLLECTOR AND THERMAL ENERGY STORAGE DEVICE

Edwin S. Dizon, Willingboro, N.J., assignor to Cities Service Company, Tulsa, Okla.

Filed Jan. 3, 1977, Ser. No. 756,230
Int. Cl.[2] F24H 7/00
U.S. Cl. 126—400 **30 Claims**



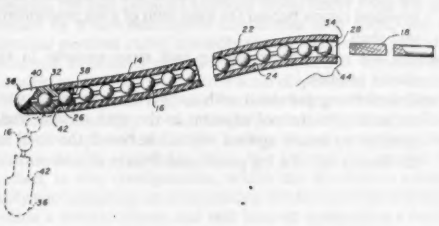
1. A solar radiation collection and thermal energy storage device comprising a housing reservoir; a phase change matrix disposed in said housing reservoir, said phase change matrix

comprising a polymeric material and a particulate phase change material, said phase change material being immiscible in said polymeric material, and being discretely dispersed in said polymeric material, said polymeric material being selected from a group consisting of polymeric polysulfide, polymeric silicone rubber, and polymeric butyl rubber, said phase change material is selected from a group consisting of polyethylene glycol, said polyethylene glycol having a molecular weight of from about 4500 to about 20,000, pentacasone, trituacontane, camphene, myristic acid, methyl oxalate, stearic acid, and tristearin, and said matrix includes a curing agent comprising from about 1 wt% to about 10 wt% of said matrix, and a heat exchange means being disposed in said matrix for moving a heat absorbing medium therethrough, said heat exchange means being in communication with the outside of said reservoir.

4,111,190
MEDICAL APPLICATOR ASSEMBLY FOR CHAIN CYSTOURETHROGRAPHIC PROCEDURE

Jane Plumridge, 17 Stoney Brook Dr., Glastonbury, Conn. 06033

Filed Nov. 11, 1976, Ser. No. 741,151
Int. Cl.² A61B *6/00*
U.S. Cl. 128—2 A **7 Claims**

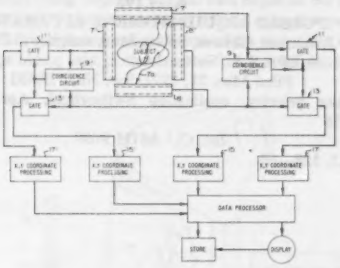


1. In a medical applicator assembly for use in a cystourethro examination comprising a tubing having a hollow longitudinal passage, a metallic bead chain loosely and slideably positioned within said passage and means for slideably displacing said chain from said passage, the combination wherein said tubing is a flexible elongated plastic tube having a smooth uninterrupted outer surface and a passage extending axially along the entire length thereof with coaxial proximal and distal openings at opposite ends of said passage, said chain being of substantially the same length as the tubing and having proximal and distal ends with a soft sterile tip secured to the proximal end of said chain, said tip comprising a stem portion snugly received within said passage, an integral head portion larger than said passage and an intermediate shoulder connecting said stem and head portions and abutting the end of said tubing at said proximal opening, said chain being firmly embedded in said tip, said head portion extending beyond the proximal end of said tubing axially of said passage and having a tapered surface with a maximum diameter substantially equal to the diameter of the outer surface of said tubing, said shoulder extending radially from said stem portion to said tapered surface, said chain including means for holding said tip in alignment with said tubing and said shoulder in engagement with said tubing to facilitate insertion of said tip and the proximal end of said tubing through the urinary canal and into the bladder of a patient, said displacing means being an independent member movable into engagement with the distal end of said chain for slideably displacing the chain relative to the tubing and dislodging said stem portion from said passage.

4,111,191
APPARATUS AND METHOD FOR EXAMINING BLOOD VESSELS OF INTEREST BY TRACKING POSITION WITH RESPECT TO TIME OF PARTICLES INTRODUCED THEREIN

Robert F. Shaw, 50 St. Germain Ave., San Francisco, Calif. 94114

Continuation of Ser. No. 249,161, May 1, 1972, abandoned. This application Jul. 10, 1974, Ser. No. 487,425
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2.05 F **51 Claims**



1. Apparatus for interacting with a number of particles which can be introduced into the blood of a subject and which can provide signals from within a vessel of interest that can be detected outside the body, the apparatus comprising:

detector means positionable near the body of the subject for detecting the signals from the number of particles at successive locations of each of the number of particles at successive times during the travel of each particle through a vessel of interest;

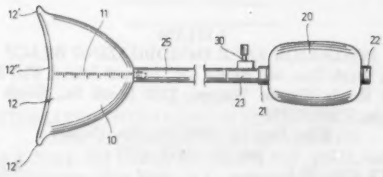
circuit means coupled to said detector means for providing output manifestations from successive positions of each of the number of particles at successive times during the travel thereof through the vessel of interest; and

output means responsive to the output manifestations from said circuit means for providing an indication of the relative internal cross-sectional areas of the vessel of interest at successive positions along the cource of the vessel of interest.

4,111,192
BIOLOGICAL TISSUE EXERCISING DEVICE

An-Chuan Wu, No. 217, Chien Kuo S. Rd., Taipei, Taiwan

Continuation-in-part of Ser. No. 588,168, Jun. 18, 1975, Pat. No. 4,029,088. This application Feb. 7, 1977, Ser. No. 765,891
Int. Cl.² A61H *1/00*
U.S. Cl. 128—38 **9 Claims**



1. A device for exercising biological tissue, particularly tissue of the female human breast, comprising a shape-retaining cup constituted by transparent material and adapted to be placed over a human breast with clearance so as to define an interior space therewith, said cup comprising indicating means thereon for indicating the distance through which the breast has been drawn; a housing having an inlet in communication

with air in said interior space, and an outlet in communication with air at the exterior of said cup; and electrically-operated means in said housing for exhausting air from said interior space through said inlet to be expelled via said outlet to the exterior of said cup so as to draw the breast from an intial position in direction further into said cup, said electrically-operated means also being operative for admitting air from the exterior of said cup through said outlet to be admitted via said inlet into said interior space so as to permit the breast to return towards the initial position.

4,111,193

PULSED LIQUID HYGIENE APPARATUS

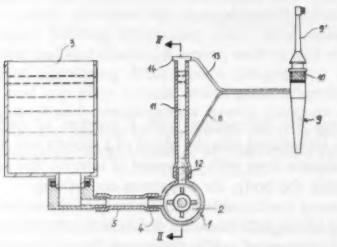
Pierre J. Jousson, Geneva, Switzerland, assignor to Les Produits Associes LPA S.A., Switzerland

Filed Mar. 21, 1977, Ser. No. 779,532

Claims priority, application Switzerland, Apr. 8, 1976, 4414/76

Int. Cl.[2] A61H 9/00

U.S. Cl. 128—66 **7 Claims**



1. In an apparatus for body care, in particular for the massage of gums and cleaning teeth, comprising a piston pump; a liquid reservoir; a hydraulic motor disposed in a hand-held casing to drive a treatment instrument; said pump comprising an intake chamber connected to an inlet conduit leading from the reservoir, a piston reciprocated by a motor, a working chamber connected to an outlet conduit which is connected to said hydraulic motor and an inlet valve disposed in a passage between the intake and working chambers to close said passage during the operative stroke of the piston and open said passage in the suction stroke; a vertical relief flue leaving the working chamber end open at its upper end which is higher than the maximum liquid level of the reservoir; and a return pipe for returning a liquid from the hand-held casing to the hydraulic motor, the improvement wherein said return pipe is connected to said intake chamber via a coupling element fixed in the upper end of the relief flue, said coupling having an axial opening placing the relief flue in communication with the ambient air and means for slowing of the fall of liquid from the return pipe into the relief flue.

4,111,194

POSTERIOR KNEE IMMOBILIZING BRACE

Rollin Webb Cox, 340 Bimini Dr., Merritt Island, Fla. 32952, and Randy Charles Watson, 2201 South St., South Lake Tahoe, Calif. 95731

Filed Dec. 27, 1976, Ser. No. 754,004

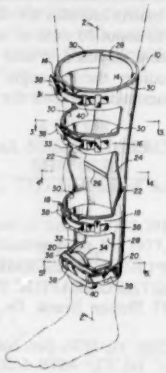
Int. Cl.[2] A61F 3/00

U.S. Cl. 128—80 C **9 Claims**

1. A knee brace comprising:

an elongated shell of generally semi-circular cross section having an elongated front opening of a width sufficient to enable a knee and adjacent leg portions to be positioned within said shell, said shell comprising a plurality of longitudinally spaced pairs of opposed flexible strap sections extending laterally into said front opening, said strap sections being movable between an open position wherein a leg may be positioned in or removed from said shell through said front opening and a closed position wherein the strap sections of each pair are disposed in closely spaced relation across said front opening and serve to retain a leg in said shell,

air permeable padding means disposed on the inner surface of said shell and extending longitudinally along the rear portion thereof and from the rear portion thereof along the inner surface of said strap sections, said padding means comprising an inwardly extending wedge member having



the apex thereof located such that it will be adjacent to the popliteal region behind the knee joint of a leg positioned in said shell, and

means for releasably retaining said strap sections in said closed position,

said shell being provided with outwardly relieved portions on both sides thereof adjacent to the apex of said wedge member to insure against contact between the shell and the knee joint of a leg positioned therein at said portions.

4,111,195

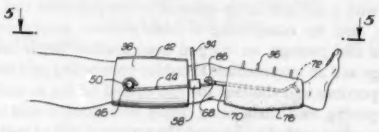
ORTHOPEDIC UPPER AND LOWER LEG SUPPORT

Alonzo J. Neufeld, 1650 Parway Dr., Glendale, Calif. 91206

Filed Sep. 13, 1976, Ser. No. 722,869

Int. Cl.[2] A61F 5/04

U.S. Cl. 128—83 **8 Claims**



1. In an orthopedic upper and lower leg supporting apparatus,

an upper leg supporting device,

a lower leg supporting device,

hinge means connecting the devices,

the improvement comprising:

said hinge means being articulated so as to be positionable laterally toward and away from the leg and so as to be at all times easily movable with the leg according to the bending of the knee,

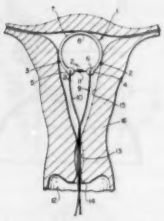
said hinge means including hook and eye connections.

4,111,196

INTRAUTERINE CONTRACEPTIVE DEVICE OF C OR OMEGA FORM WITH TUBULAR INSERTER AND METHOD OF PLACEMENT

Lionel C. R. Emmett, 7C Denmark Rd., Kingston-upon Thames, Surrey, England, assignor to Lionel C. R. Emmett, Kingston-upon Thames, England

Division of Ser. No. 489,982, Jul. 19, 1974, Pat. No. 3,973,560.
This application Feb. 23, 1976, Ser. No. 660,678
Int. Cl.[2] A61F 5/46
Claims priority, application United Kingdom, Jul. 27, 1973, 35816/73
U.S. Cl. 128—130 51 Claims



1. A combination intrauterine contraceptive device and tubular inserter for the insertion of the device into the fundal region of the uterine cavity including a linear type of intrauterine contraceptive device made of flexible material comprising an elongate member which, in situ, assumes a linear arch-shape wherein the two terminal portions of the linear form are connected by a non-interrupted continuous arch form, and the terminal portions curve inwardly toward each other providing incurved, oppositely directed linear portions in opposed relationship at each end of the arch form disposed in substantially linear alignment, in situ; said member being of material with sufficient flexibility to assume a substantially straight linear form when placed inside the inserter to accommodate insertion, and after expulsion from the inserter to assume the arched, in situ, configuration, which has dimensions substantially encompassing an area enabling the device to be contained within a normal uterus; and said inserter comprising a hollow tube, of sufficient internal diameter to accommodate said device when said device is substantially straightened out, and a plunger which can slide interiorly of the tube with a substantially free close fit; said device further including a metallic contraceptive agent comprising a wire wound around at least part of said member, said member having a plurality of surface serrations and wherein said wire is wound around the member whereby the coils of wire fit between and within serrations with a fit which enables looseness of the coils on the member and retains the coil in the associated serrations in spaced apart disposition on the member.

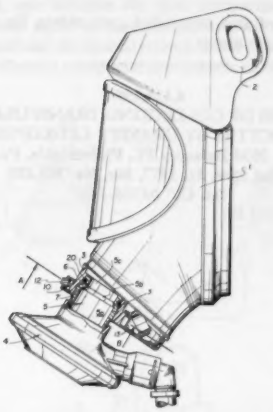
4,111,197

RESPIRATORY DEVICE COUPLING CONSTRUCTION

Ernst Warncke, and Manfred Gdulla, both of Lübeck, Germany, assignors to Dräger werk Aktiengesellschaft, Germany

Filed Feb. 22, 1977, Ser. No. 770,371
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609034
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—142.4 3 Claims

1. A quick connecting construction for a respiratory device, comprising a respiratory device having a tubular breathing connection with a cylindrical receiving recess for accessory apparatus, an accessory apparatus having a tubular portion slidably inserted into the cylindrical receiving recess and having an exterior surface with an annular locking groove, said respiratory device having a tubular cover member overlying said tubular portion of said accessory apparatus and having an exterior side wall with an actuator receiving slot therein, a U-shaped locking spring having a web portion with an actuating part engaged in the actuator receiving slot of said tubular cover member, said locking spring having first and second opposite leg portion connected to respective sides of said web portion, said tubular breathing connection of said respirator device having a locking slot defined in respective opposite sides thereof and with an edge defining an end of the slot opposite to the spring web portion and also opposite to the actuator receiving slot which forms a cam surface, said spring leg portions being engaged into respective tubular portion slots and into the locking groove to hold said tubular portion of said connecting device to said respirator device, the respective ends of said springs being engaged on said cam edges of the respective slots whereby upon movement of said actuator part in a downward direction toward said cam edges move the ends of said springs along said cam edges to force them out of said



groove and release said tubular portion of said connecting device wherein said respirator device comprises a breathing mask, said tubular breathing connection of said breathing mask having an inner diameter part and an outer diameter part of a greater diameter than said inner diameter part and with an intermediate part between said outer and inner diameter part bevelled inwardly from the outer diameter part to the inner diameter part, said accessory apparatus comprising a lungs control device having said tubular portion of an exterior configuration corresponding to the interior configuration of said cylindrical receiving recess and having an intermediate diamteer portion which abuts against the intermediate diameter portion of said cylindrical receiving recess when it is fully inserted so as to align said annular locking groove with said spring leg portions.

4,111,198

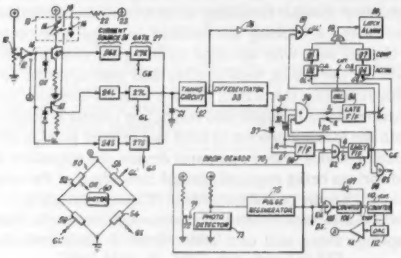
AUTOMATED INTRAVENOUS FLUID REGULATING AND ADMINISTERING APPARATUS

Alvin J. Marx, 315 College Rd., Bronx, N.Y. 10471, and Abraham Edelman, New York, N.Y., assignors to Alvin J. Marx

Filed Jun. 2, 1977, Ser. No. 802,891
Int. Cl.[2] A61M 5/16
U.S. Cl. 128—214 E 11 Claims

1. In combination in intravenous fluid regulator apparatus, timing circuit means including a timing capacitor, plural current sources, plural controlled gate means each selectively connecting an associated current source with said timing capacitor, fluid drop sensing means, and logic means having

plural inputs connected to said fluid drop sensing means and to said timing means and plural outputs each connected to a



different one of said controlled gate means for selectively enabling said gate means.

4,111,199

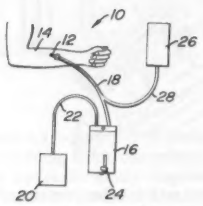
METHOD OF COLLECTING TRANSFUSABLE GRANULOCYTES BY GRAVITY LEUKOPHERESIS

Isaac Djerassi, 2034 Delancey Pl., Philadelphia, Pa. 19103

Filed Mar. 31, 1977, Ser. No. 783,380

Int. Cl.[2] A61M 5/00

U.S. Cl. 128—214 R **17 Claims**



1. A leukopheresis process comprising withdrawing a portion of blood from a human, separating the red and white cells from the plasma and platelets in the blood, mixing the packed red and white cells with a solution comprising a red blood cell sedimenting agent and an isotonic balanced salt solution, said red blood cell sedimenting agent being present in a range of 1½ to 6% by weight of said isotonic balanced salt solution, permitting the mixture of red blood cells, white blood cells, sedimenting agent and isotonic balanced salt solution to stand to allow the red blood cells to sediment spontaneously to the bottom of the container in which the mixture is placed, separating the red blood cells, separating the white cells from the solution for transfusion to a patient, and reinjecting the red cells into the human donor of white cells.

4,111,200

EYE DROP DISPENSER

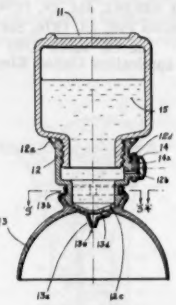
Frank Sbarra, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Dec. 10, 1975, Ser. No. 639,412

Int. Cl.[2] A61M 1/00

U.S. Cl. 128—233 **2 Claims**

1. A device for accurately dispensing measured drops of liquid into a users eye, comprising a container having an open end and a hollow dispenser removably mounted axially exteriorally on said open end of the container in combination with a cup rotatably mounted axially on an opposite end of said dispenser having a portion adapted to fit around the users eye, said cup and dispenser having transverse relatively movable sealing surfaces including an axial orifice through said cup and an aperture in said dispenser sealing surface whereby said orifice registers with said aperature in one position to provide communication from the container into the cup, including a hollow member mounted on the external surface of said dispenser, longitudinally between the container and said cup, with a channel provided through the side wall of the dispenser



providing communication from the interior of said member of said dispenser adjacent said container end, said member being flexible whereby manual pressure on said member will eject a measured drop from the container through the dispenser, the orifice and to the users eye, when the said aperture and orifice are orifice are in registry.

4,111,201

OSMOTIC SYSTEM FOR DELIVERING SELECTED BENEFICIAL AGENTS HAVING VARYING DEGREES OF SOLUBILITY

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Nov. 22, 1976, Ser. No. 743,760

The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.

Int. Cl.[2] A61M 31/00

U.S. Cl. 128—260 **21 Claims**

1. An osmotic system for the controlled delivery of a beneficial agent to an environment of use, said system comprising:

a. a wall formed of a material permeable to the passage of an external fluid in the environment of use and substantially impermeable to the passage of agent; said wall surrounding and forming;

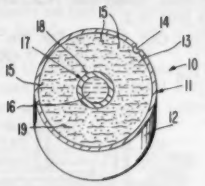
b. a compartment containing a beneficial agent and a suspending agent;

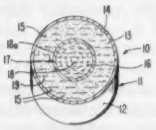
c. a delivery member in the compartment comprising a film formed of an expandable semipermeable material surrounding an osmotically effective compound which compound exhibits an osmotic pressure against gradient across the film against fluid in the compartment;

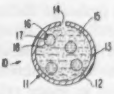
d. a passageway in the wall communicating with the compartment and the exterior of the system for delivering beneficial agent from the system; and

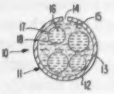
e. wherein in operation, when the system is in the environment of use, fluid from the environment is imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, forming a suspension containing beneficial agent and activating the delivery member to imbibe fluid from within the compartment and increase in volume through sequential changes to an state, whereby through

the cooperation of the suspending agent and the delivery member beneficial agent is delivered through the passage-









way from the system at a controlled rate over a prolonged period of time to the environment.

4,111,202

OSMOTIC SYSTEM FOR THE CONTROLLED AND DELIVERY OF AGENT OVER TIME

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Nov. 22, 1976, Ser. No. 743,975
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—260 **26 Claims**

1. An osmotic therapeutic system for the controlled delivery of a beneficial drug to a biological environment, comprising:

a. a wall formed of a semipermeable material permeable to the passage of external fluid present in the environment and substantially impermeable to the passage of drugs and compounds; the semipermeable wall surrounding and forming;

b. a first and second compartment, said first compartment containing a drug that is in direct communication with the semipermeable wall, said second compartment containing an osmotically effective compound that exhibits an osmotic pressure gradient across the semipermeable wall against the fluid, with the compartments separated by a flexible membrane, which membrane is substantially impermeable to the passage of drug, compound and fluid;

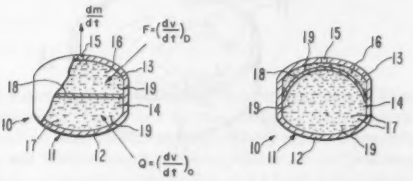
c. a passageway in the wall communicating with the compartment containing the drug for delivering drug from the system; and,

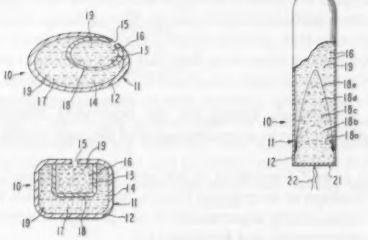
d. wherein in operation when the system is in the environment of use, fluid from the environment is imbibed through the wall into (1) the first compartment containing drug in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall thereby forming a formulation containing drug, and into (2) the second compartment containing osmotic compound in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall thereby continuously filling the second compartment and expanding the membrane into the first compartment, whereby, through the combined actions of the first and second compartments, drug is delivered through the passageway from the system at a controlled rate over a prolonged period of time.

9. An osmotic system for the controlled and continuous delivery of a beneficial agent to the environment of use comprising:

a. a shaped wall formed of a semipermeable material permeable to the passage of an external fluid in the environment of use and substantially impermeable to the passage of beneficial agent and compound, the shaped semipermeable wall surrounding and forming;

b. a first and second compartment, said compartments separated by an expandable membrane permeable to fluid and substantially impermeable to beneficial agent and compound, and wherein the first compartment contains a beneficial agent in communication with the semipermeable wall and the second compartment contains an osmotically effective compound that exhibits an osmotic pressure





gradient directly across the semipermeable wall against the fluid;

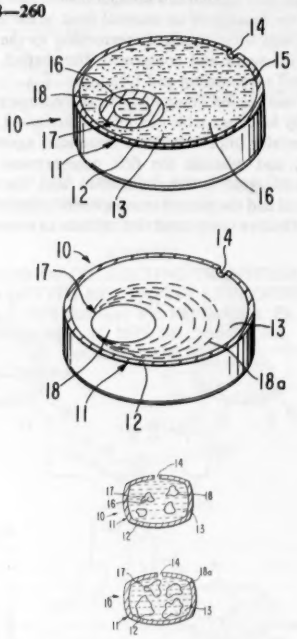
c. a passageway in the semipermeable wall communicating with the beneficial agent compartment and the exterior of the system for delivering the beneficial agent from the system; and,

d. wherein in operation, when the system is in the environment of use, fluid from the environment is imbibed through the semipermeable wall into (1) the first compartment containing the beneficial agent in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, and into (2) the second comparment containing osmotically effective compound through the membrane at a rate determined by the permeability of the membrane and the osmotic pressure gradient across the membrane, said imbibitions increasing the volume of the second compartment and expanding the membrane into the compartment containing beneficial agent is delivered through the passageway from the system at a controlled rate over a prolonged period of time.

4,111,203
OSMOTIC SYSTEM WITH MEANS FOR IMPROVING DELIVERY KINETICS OF SYSTEM

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Nov. 22, 1976, Ser. No. 744,089
The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—260 13 Claims



1. An osmotic system for the controlled dispensing of a beneficial agent to an environment of use, said system comprising:

(a) a wall formed of a material that is permeable to the passage of an external fluid in the environment of use and substantially impermeable to the passage of agent, the wall surrounding and forming;

(b) a compartment containing a beneficial agent;

(c) means in the compartment comprising a film permeable to the passage of fluid, substantially impermeable to the passage of agents and surrounding an osmotically effective agent that exhibits an osmotic pressure gradient across the film against fluid in the compartment, said means changeable from a rested to a dispensing state on imbibition of fluid for increasing the amount of beneficial agent dispensed from the compartment;

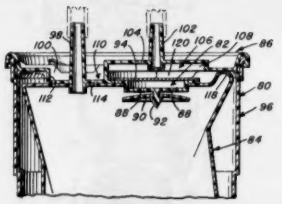
(d) a passageway in the wall communicating with the compartment and the exterior of the system for dispensing beneficial agent from the compartment; and

(e) wherein in operation, when the system is in the environment of use, fluid from the environment is imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall thereby forming a liquid formulation containing beneficial agent, and causing the means to imbibe fluid from within the compartment and change to a dispensing state, whereby beneficial agent is dispensed from the system at a volume flow rate *dv/dt,* wherein *dv* is the volume of formulation transported through the passageway per unit time *dt,* over a prolonged period of time.

4,111,204
SUCTION COLLECTION SYSTEM

Stephen Roy Hessel, Somerville, N.J., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Oct. 7, 1976, Ser. No. 730,404
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—276 23 Claims

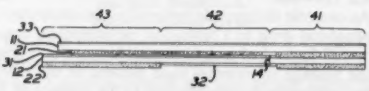


1. For use in a collection system comprising a rigid reusable canister, a drainage receiving assembly, said drainage receiving assembly including a lid receivable over and releasably sealable to the canister, a drainage fixture fixed to and extending through said lid, a flexible receiving bag sealed to the lid about the drainage fixture and depending from said lid for reception within the canister, a suction fixture fixed to and extending through said lid in space relation to said drainage fixture, said suction fixture communicating with the exterior of said bag, an opening defined through said bag remote from said drainage fixture and communicating with the exterior of the bag and the suction fixture, and a patch of air pervious-liquid impervious material positioned directly over said bag opening between the bag and the suction fixture, and in the path of communication from the bag to the exterior of the bag inward of the canister and inward of the suction fixture.

4,111,205
REFASTENABLE DIAPER TAB CLOSURE

Suzette B. Nemeth, Painesville, Ohio, assignor to Avery International Corporation, San Marino, Calif.

Filed Feb. 22, 1977, Ser. No. 770,646
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—284 4 Claims



1. A diaper having a linerless refastenable two-substrate diaper tab formed of diaper tab stock comprising a two-substrate web construction made up of initially flat but flexible layers suitable to be formed in long passes along the machine direction of a coating and laminating line and to be rolled up for storage and shipment, and unrolled for use by diaper manufactures, and fabricatable completely by web coating, slitting and web-to-web laminating operations and without the necessity for folding operations, and suitable for high speed dispensing on automatic equipment, said tab including a first substrate extending, transversely to machine direction, along first, second and third length portions and bearing first substrate adhesive on its underside, a second substrate extending along said first, second and third length portions and bearing second substrate adhesive on its underside, said second substrate adhesive extending at least partially along at least said first and third length portions, said second substrate being slit or divided along the machine direction in the region of adjacency of said first and second length portions, said second substrate carrying first substrate release means on its upper side at least co-extensively with any first substrate adhesive at the second and third length portions and carrying second substrate release means on

its underside along said second length portion whereby said third and second length portions of said second substrate can be folded together as by a diaper manufacturer, to protect the second substrate adhesive on said third length portion and can then be unfolded to freshly expose said adhesive, as upon fastening of the diaper, and subsequently, as upon unfastening of the diaper, said first substrate can be peeled back from said second substrate at said second and third length portions to freshly expose part of said first substrate adhesive for subsequent refastening of the diaper.

4,111,206

SURGICAL INSTRUMENT FOR APPLYING METAL STAPLES TO ORGANS AND TISSUES AND FOR SIMULTANEOUS DIVISION THEREOF

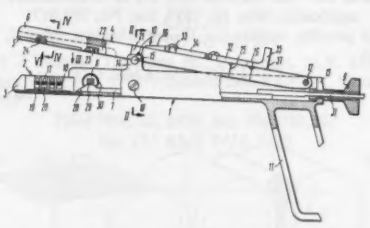
Alexandr Alexandrovich Vishnevsky, Novokuznetskaya ulitsa, 13/15, kv. 269; Ivan Alexandrovich Korolkov, Polyarnaya ulitsa, 52, korpus 2, kv. 174; Boris Andreevich Smirnov, ulitsa Borisa Galushkina, 17, kv. 26; Tatyana Lukyanovna Ivanova, Polyarnaya ulitsa, 52, korpus 3, kv. 403; Arnold Aramovich Adamian, ulitsa Kakhovka, 10/12, korpus 1, kv. 3, and Galina Vladimirovna Mitkova, Novokuznetskaya ulitsa, 13/15, kv. 269, all of Moscow, U.S.S.R.

Filed Apr. 29, 1976, Ser. No. 681,689

Claims priority, application U.S.S.R., May 4, 1975, 2130062

Int. Cl.[2] A61B *17/32*

U.S. Cl. 128—305 **7 Claims**



1. In a surgical instrument for suturing and dividing tissue, a pair of means one of which is an elongated staple-inserting means and the other of which is an elongated clinching means, connecting means operatively connected with said pair of means for interconnecting them for movement one with respect to the other to and from an operative position where the staple-inserting means and clinching means clamp between themselves tissue which is to be operated on, said staple-inserting means carrying two rows of staple-driving members for driving staples toward said clinching means while the latter carries in alignment with said rows of staple-driving members a pair of anvil members for engaging the tips of the driven staples after they penetrate through the tissue and for bending said tips, said rows of staple-driving members defining between themselves a space having a given length and said clinching means carrying between said anvil members an elongated elastic member aligned with and being at least as long as said space while having a surface directed toward said space when said pair of means are in said operative position thereof, elongated actuating means supported by said staple-inserting means for movement in a given direction therealong to displace said staple-driving members toward said clinching means, and a rotary knife disk supported by said elongated acutating means for rotation about an axis extending centrally through and being perpendicular to said disk while also extending transversely with respect to said given direction, with said disk being situated at a location where said disk will move with said actuating means along said space between said rows of staple-driving members while said disk has a diameter great enough for penetrating at an outer peripheral cutting edge of said disk into said elastic member which is situated between said anvil members, said disk having only a relatively small portion of said peripheral cutting edge penetrating into said elastic member at any given instant and said disk rotating in response to frictional engagement with said elastic member while travelling along and penetrating into the latter for progressively cutting with a slicing action cleanly through tissue clamped between said pair of means.

4,111,207

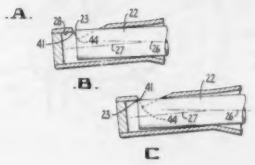
NOTCHED TUBULAR CUTTING INSTRUMENT

William Seiler, Jr., Van Nuys, Calif., assignor to David Kopf Instruments, Tujunga, Calif.

Filed Oct. 28, 1976, Ser. No. 736,313

Int. Cl.[2] A61B *17/32*

U.S. Cl. 128—305 **4 Claims**



1. In a cutting instrument having an elongated tubular housing having a tip formed with a cutting orifice, a blade comprising a resilient inner tubular member slidably mounted coaxially within said tubular housing, driving means for reciprocating said blade across said cutting orifice, and a bend in said tubular housing displacing said tip and said cutting orifice in a direction toward said blade, the improvement comprising:

said cutting orifice being formed in the tip of said housing as a notched opening defined by a pair of side edges and a cutting edge which come together to form the base of said notched opening, said cutting edge extending from said base distally to one end of said opening, said pair of side edges extending from said base proximally to the opposite end of said opening, said base being located longitudinally intermediate the ends of said opening, said cutting edge having a rake angle greater than 10° and less than 45°, whereby said cutting edge and side edges continuously guide said blade across said notched opening and provide a shearing action between said blade and cutting edge.

4,111,208

PROCESS FOR DRILLING HOLES IN HARD MATERIALS, IN SURGICAL PROCEDURES, AND APPARATUS FOR CARRYING OUT THE PROCESS

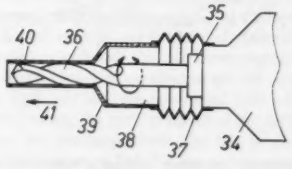
Roland Leuenberger, 15 chemin du Bois de la Chapelle, 1215 Onex, Geneva, Switzerland

Filed Jun. 28, 1977, Ser. No. 810,763

Claims priority, application Switzerland, Dec. 22, 1976, 16177/76

Int. Cl.[2] A61B *17/32, 17/16*; B23B *35/00, 39/10*

U.S. Cl. 128—305.1 **15 Claims**



1. A process for drilling holes in hard materials in surgical procedures comprising driving a drilling tool with a movement

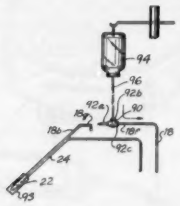
of alternating rotation with an amplitude of less than one revolution.

4,111,209

TOPICAL HYPOTHERMIA APPARATUS AND METHOD FOR TREATING THE HUMAN BODY AND THE LIKE

Sidney Wolvek, Brooklyn, N.Y.; Bruce L. Hanson, Wayne, N.J., and David Bregman, New York, N.Y., assignors to Datascope Corporation, Paramus, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,228
Int. Cl.[2] A61F *7/00*
U.S. Cl. 128—400 **5 Claims**



1. A method of cooling a region of the human body comprising the steps of:

providing a coolant circuit assembly including a length of flexible tubing and a flexible, inflatable bag fluidly coupled to said tubing by a lumen having at least two parallel passages formed therethrough;

while maintaining the bag in a deflated condition, introducing coolant fluid into the entire coolant circuit except for the bag;

introducing said deflated flexible bag into the region to be treated;

introducing additional coolant fluid into the coolant circuit thereby inflating the bag, the additional coolant fluid being introduced in an amount based upon the volume of the region of the body to be coated;

cooling said coolant liquid; and

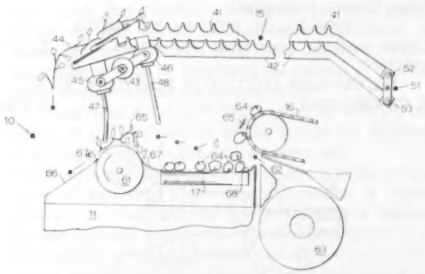
circulating said coolant fluid through said coolant circuit.

4,111,210

TRASH-FREEING REAR CROSS-CONVEYOR FOR TOMATO HARVESTER

Daniel L. Freeman, Rio Vista; Darryl G. Bettencourt, Lodi, and George E. Marshall, Jr., Sacramento, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 27, 1976, Ser. No. 754,128
Int. Cl.[2] A01D *45/00*
U.S. Cl. 130—30 R **11 Claims**



1. In a tomato harvester having a wheel-mounted frame supporting a centrally located fruit collecting conveyor for delivering fruit rearwardly to a rear cross-conveyor assembly having at least one transversely moving conveyor and a blower for directing a strong rearward airstream from adjacently below the rear end of the collecting conveyor across said conveyor for separation and disposal of vegetative and mineral trash, an improvement in said rear cross-conveyor assembly comprising the combination of:

a rearwardly rotating roller having an axis of rotation generally parallel to the direction of travel of said transverse conveyor and rotationally mounted on said frame adjacent to but behind said conveyor,

a series of moving resilient fingers depending downwardly from above the roller for engaging and agitating said trash otherwise accumulating on said roller and for facilitating movement of said trash upon said roller and away from said rear cross-conveyor assembly, and

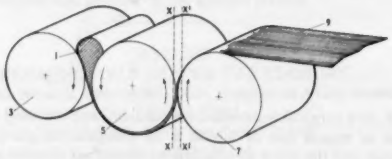
slide means mounted adjacent to but behind said roller for removing said trash therefrom and directing it to the ground.

4,111,211

SMOKING MIXTURES

Henry Russell Hincklieff, and Richard Hugh Banwell, both of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 563,448, Mar. 31, 1975, abandoned. This application May 16, 1977, Ser. No. 797,017
Claims priority, application United Kingdom, May 2, 1974, 19245/74
Int. Cl.[2] A24D *1/18;* A24B *3/14*
U.S. Cl. 131—2 **20 Claims**



1. A process for the production of a smoking mixture film comprising forming a pasty mass containing combustible binder, inorganic filler and water, said pasty mass having a low phase angle and feeding said pasty mass to a roll-mill wherein successive rollers operate at successively higher peripheral speeds, such speeds and the clearances between the rolls being adjusted to produce a film having one surface closely configured with parallel ridges.

4,111,212

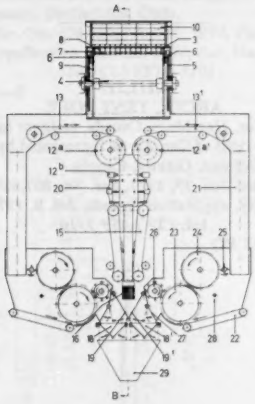
DOSING AND WEIGHING OF CUT TOBACCO

Jouke Bakker, Joure, Netherlands, assignor to Douwe Egberts Tabaksmaatschappij B.V., Joure, Netherlands

Filed Aug. 2, 1973, Ser. No. 384,814
Claims priority, application United Kingdom, Aug. 9, 1972, 37114/72; Oct. 25, 1972, 49199/72
Int. Cl.[2] A24C *1/02*
U.S. Cl. 131—21 A **16 Claims**

1. A method of dosing long fibre tobacco comprising the steps of providing an approximate quantity of tangled long fibres, said approximate quantity being less than the quantity required, plucking tufts from the tangled mass of long fibres with the aid of needles gradually emerging from holes in a tangentially moving surface, which needles are brought into contact with the mass as it is fed therepast after which the needles are retracted to set the tufts free, subsequently provid-

ing a sufficient quantity of disentangled long fibres and adding a predetermined quantity of short fibres to the dosed portions

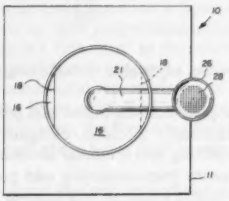


of long fibres to make up said approximate quantity to the required quantity.

4,111,213
SMOKING PIPE

Albert J. Shanto, 114 State St., Brockport, N.Y. 14420, and Bruce V. Bevins, 5708 Wautoma Beach Rd. W., Hilton, N.Y. 14468

Filed Nov. 22, 1976, Ser. No. 743,637
Int. Cl.[2] A24F *1/14, 1/30*
U.S. Cl. 131—173 **4 Claims**



1. A smoking pipe having a base, a normally upright standpipe having a generally cylindrical wall secured to said base of extend upward from said base for containing liquid up to an intermediate level in said standpipe, said standpipe wall having an inlet hole above said intermediate level, a bowl support pipe removably extending snugly through said inlet hole, means for mounting a bowl on an outer end of said bowl support pipe outside said standpipe, and said standpipe wall having a vent hole above said intermediate level, said pipe comprising:

a. a straight smoke inlet pipe having a diameter and length both substantially less than said standpipe, said smoke inlet pipe being arranged generally concentrically with said standpipe within said standpipe to extend from a bottom region of said standpipe near said base up to a region above said intermediate level;

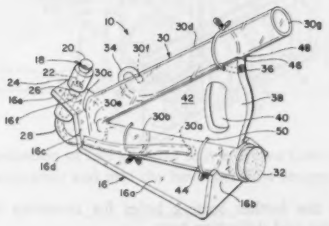
b. a plurality of baffle plates disposed to fit around and encircle said inlet pipe at successive levels below said intermediate level, said baffle plates being generally parallel with each other and extending radially from said inlet pipe outward to said wall of said standpipe, and said baffle plates being arranged for supporting said inlet pipe concentrically within said standpipe and for forming a labyrinthine passage for smoke; and

c. an upper end of said inlet pipe and an inner end of said bowl support pipe being configured relative to each other to provide a manually releasible fit between said upper end of said inlet pipe and said inner end of said bowl support pipe to allow for manually removing said bowl support pipe from said inlet pipe and said standpipe.

4,111,214
WATER PIPE

Robert W. Flesher, 11007 Drumm Ave., Kensington, Md. 20795

Filed Dec. 6, 1976, Ser. No. 747,608
Int. Cl.[2] A24F *1/14, 1/30*
U.S. Cl. 131—173 **11 Claims**



1. In a water pipe having means connecting together a bowl, a water container, a mouthpiece, purging means and a stand, the improvement comprising: the mouthpiece and water container comprising a tubular configuration in "V" shape with first and second legs and having a throat at the apex thereof, means for holding the "V" shape in predetermined attitude with the apex of the "V" shape down, means for closing an end of the first leg; said means for connecting including a connecting means tube from the bowl to an intermediate portion of the first leg, said purging means including a purging means tube having communication at a first end thereof with an intermediate portion of the second leg, a handle having attachment to the tubular configuration for manually holding the tubular configuration, and said purging means tube having a second end disposed proximate the handle in position adjacent the upper end of said second leg in position permitting manual closing and opening of the purging means from above said purging means tube connection with the intermediate portion of the second leg.

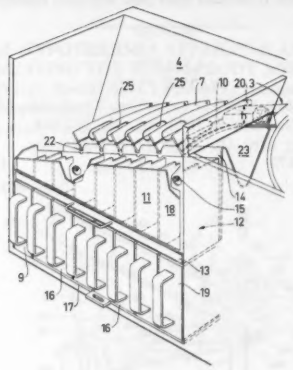
4,111,215
COIN SORTING MECHANISM

Gösta Wicklander, 1 Skonertvagen, Alnö, Sweden (S-860 24)

Filed Dec. 8, 1976, Ser. No. 749,394
Claims priority, application Sweden, Dec. 15, 1975, 7514135
Int. Cl.[2] G07D *3/04*
U.S. Cl. 133—3 C **9 Claims**

1. A coin sorting mechanism comprising a coin passage for travel of coins to be separated according to diameter and means coupled to said passage for sorting the coins according to diameter, the latter said means comprising a succession of deflection bars having respective graduated sorting holes for deflecting from the coin passage, coins, disks and the like with a diameter greater than the sorting hole in the respective deflection bar, means on each said bar for gravitationally conveying the deflected coins along the bar for discharge therefrom, a receiving station having compartments for receiving the sorted coins, each said bar being provided with a further sorting hole located along the path of travel of the deflected coins in proceeding for discharge from the bar to the receiving station, said further sorting hole having an extent in one direction which is less than the diameter of the coin which the respective deflection bar is to divert, said further sorting hole being positioned with respect to the coin conveying means of the respective deflection bar for discharge of undersize coins

before they have reached the location of discharge from the bar to the receiving station and channel means positioned

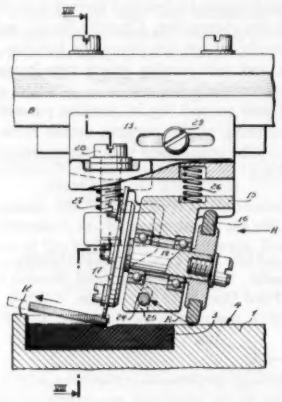


beneath the further sorting holes for receiving undersized coins from said deflection bars.

4,111,216
CENTRIFUGAL COIN SORTER

Marcel Brisebarre, Thoiry, France, assignor to Systems and Technics S.A., Gland, Switzerland

Filed Feb. 23, 1977, Ser. No. 771,371
Claims priority, application Switzerland, Apr. 1, 1976, 4042/76
Int. Cl.[2] G07D *3/06*
U.S. Cl. 133—3 A **17 Claims**

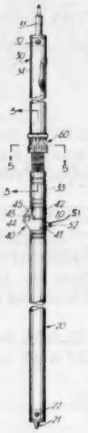


1. In a coin sorting machine comprising a frame on which is pivoted a rotary plate and means for rotating said plate; a funnel for receiving the coins in loose form located in the central part of said plate; positioning means for the coins permitting the discharge from said funnel of only those coins which are placed flat on the surface of the rotary plate; a peripheral shoulder preventing the coins from leaving the rotary plate as well as at least one station for the selection and extraction of one denomination of coins from among the others; the improvement in which each selection station has on the one hand means carried by the rotary plate permitting a movement of at least a radially inner part of a coin below the upper surface of the plate and on the other hand coin-contacting means carried by the frame and entering into contact with said radially inner part of a coin to be selected and which is lying flat on the rotary plate to push said radially inner part of the coin below the upper surface of the plate and to raise the radially outer part of the coin higher than said shoulder to eject the coin by centrifugal force over said shoulder.

4,111,217
ARCTIC TENT POLE

William E. Victor, Hazeldean, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jun. 17, 1977, Ser. No. 807,569
Claims priority, application Canada, Jul. 9, 1976, 256715
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—15 PQ **5 Claims**



1. A collapsible, adjustable variable length support comprising:

(a) a pair of pole sections, one of said pole sections comprising an externally threaded, elongate member telescopically projecting into a tubular member;

(b) hinge means interconnecting said pole sections for pivotal movement about an axis fixed in position relative to each of the pole sections;

(c) releasable locking means associated with said hinge and comprising interengageable cooperating portions on respective ones of the pole sections preventing pivotal movement of the hinge when adjacent ends of the pole section are in line in an end-to-end position; and

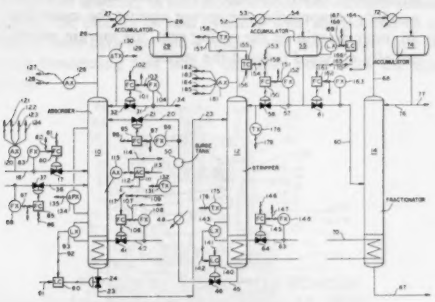
(d) a hand operable, quick release coupling associated with the threaded elongate member and tubular member selectively to convert from one to the other of fine and coarse adjustment to the length of the support at any position throughout the length of the externally threaded elongate member; said quick release coupling comprising a threaded nut secured to the tubular member and circumscribing said threaded elongate member, said threaded nut being variable in size and selectively movable into and out of threaded engagement with said threaded elongate member whereby disengagement of the threads permits free telescopic movement of the members allowing a fast coarse adjustment to the length of the support and engagement of the threads permits a fine infinite adjustment to the length of the support by rotating one of said members relative to the other and releasable lock means associated with the variable sized nut for selectively retaining the latter in threaded engagement with the externally threaded elongate member.

4,111,218

ABSORPTION PROCESS METHOD AND APPARATUS

James W. Hobbs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 474,405, May 30, 1974, Pat. No. 3,967,937. This application May 28, 1976, Ser. No. 691,121
Int. Cl.² F17D *3/01*
U.S. Cl. 137—2 **6 Claims**



1. A method comprising:
introducing an at least partially liquid input stream into a liquid accumulation zone;
withdrawing a liquid output stream from said accumulation zone;
establishing a liquid level signal representative of the liquid level within said liquid accumulation zone;
generating from said liquid level signal a correction factor signal;
utilizing said correction factor signal to modify the response of a proportional-integral-derivative means;
providing said liquid level signal and a liquid level set point signal as inputs to said proportional-integral-derivative means to produce a first signal as the output of said proportional-integral-derivative means;
establishing a second signal representative of the predicted flow rate of the liquid portion of said input stream into said accumulation zone, the flow rate of said input stream being independent of the liquid level in said accumulation zone;
adding said first signal and said second signal to produce a third signal representative of the optimum flow rate of said output stream; and
controlling the flow rate of said output stream in response to said third signal.

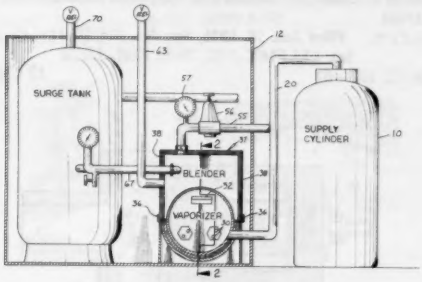
4,111,219

INDUSTRIAL FUEL BLENDER AND FUEL BLENDING METHOD

John Emil Hallberg, Peachtree City, and Otis Max Taylor, East Point, both of Ga., assignors to TMC, Inc., Atlanta, Ga.

Filed May 11, 1977, Ser. No. 795,782
Int. Cl.² F16K *19/00*
U.S. Cl. 137—3 **12 Claims**

12. A method of blending a base fuel with a fuel additive comprising the steps of:
a. providing a supply of base hydrocarbon fuel in a gaseous state under pressure within a supply container;
b. providing a supply of hydrocarbon fuel additive in a liquid state in an additive container;
c. heating the fuel additive thereby causing fuel additive to be vaporized in the additive container;
d. releasing pressurized base fuel from the supply container and forming it into a flow stream; and
e. releasing vaporized fuel additive from the additive container and drawing it by venturi action into the base fuel flow stream by drawing fuel additive into the base fuel flow stream at a venturi junction being heated by heat conducted from the additive container thereby inhibiting



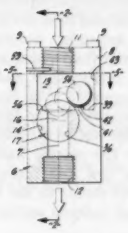
condensation of fuel additive as it is drawn from the additive container and into the base fuel flow stream.

4,111,220

SHAKE RESPONSIVE VALVE

Harry K. Winters, San Rafael, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed May 20, 1977, Ser. No. 798,825
Int. Cl.² F16K *17/36*
U.S. Cl. 137—39 **8 Claims**

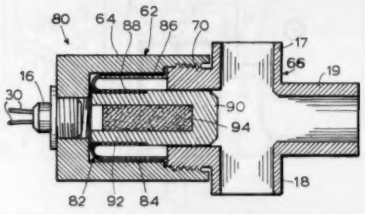


1. A shake responsive valve comprising a valve body approximately symmetrical about a longitudinal axis, means defining a plug bore through said body, said plug bore having a bore axis normal to said longitudinal axis, a plug in said plug bore and rotatable about said bore axis, means defining a plug passage in said plug, said plug passage having a passage axis in one rotated position of said plug being coincident with said longitudinal axis and in another rotated position of said plug extending across said longitudinal axis with said plug passage blanked by said valve body, means in said plut defining a valve seat extending substantially normally to said passage axis and in one rotated position of said plug being disposed in a predetermined plane normal to said longitudinal axis, means defining a flat on said plug substantially in said predetermined plane and merging with a portion of said valve seat, means defining a chamber in said valve body partially bounded by a table substantially in said predetermined plane and in one rotated position of said plug substantially merging with said flat, a pedestal on said valve body in said chamber and upstanding from said table, means defining a chamber wall upstanding from said table and disposed at a distance from said pedestal increasing toward said plug, means defining a plug wall upstanding from said flat extending around at least part of said seat and in one rotary position of said plug merging with said chamber wall, and a ball in said chamber adapted in one position to rest on said pedestal and in another position to occupy said valve seat.

4,111,221
LOW RESTRICTION, NORMALLY OPEN VALVE CONSTRUCTION HAVING A DEFORMABLE BLADDER

Charles R. Olsen, 307 Connestoga Way, Suite 37, Eagleville, Pa. 19408

Filed Jan. 28, 1976, Ser. No. 653,274
Int. Cl.[2] F16K *7/02, 7/10;* F16L *55/12*
U.S. Cl. 137—67 13 Claims



1. A normally open valve for a fluid system comprising:

a valve housing defining first and second fluid ports and a fluid passageway extending through the housing between the ports;

an expandible body including a pressure confining metallic tube closed at a first axial end and open and mounted to the housing at the opposite, second axial end, the body in the non-expanded condition having one tube portion folded co-axially within an adjacent tube portion to form an inversion in the tube wall between the axial tube ends, the first and second axial ends being movable axially of the tube relative to one another with an accompanying rolling of the fold between said tube portions to expand the body, the body in the expanded condition of the tube being extended across the fluid passageway of the housing in flow-obstructing relationship and in the non-expanded condition being removed from flow-obstructing relationship with the passageway, the inversion in the tube wall being located in the wall at a station farther from the fluid passageway than the second axial end mounted to the housing whereby the fold forming the inversion rolls toward and moves closer to the second axial end as the body expands and extends across the fluid passageway; and

means connected with the housing for pressurizing the tube between the tube ends to move the first and second ends axially of the tube relative to one another while confining the pressure within the tube walls to axially extend the tube into the expanded body condition obstructing flow in the fluid passageway of the housing.

4,111,222
ADJUSTMENT LIMITER IN A COMPRESSED GAS PRESSURE REGULATOR

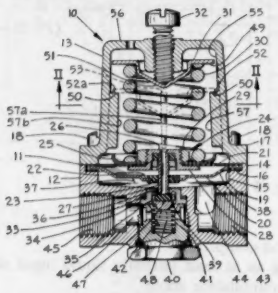
David Allen Hassell, Coon Rapids, Minn., assignor to The Cornelius Company, St. Louis Park, Minn.

Filed Jul. 26, 1976, Ser. No. 708,433
Int. Cl.[2] F16K *13/04*
U.S. Cl. 137—69 3 Claims

1. In a compressed gas pressure regulator having a regulator body, a diaphragm of flexible material carried thereby, a mounting carried by the diaphragm, a spring operatively positioned between the regulator body and the mounting, means mounted in the body and adjustably operative upon the spring for partially compressing the spring into operative engagement against the mounting for movably biasing the mounting and the diaphragm in one direction, a pressure chamber in the body and adjacent to the diaphragm, a valve chamber in the body, an inlet to the valve chamber and an outlet from the pressure chamber, a passageway connecting the pressure and valve chambers, a valve seat in the valve chamber spaced from the mounting and surrounding the passageway, a valve head in the valve chamber and adapted to sealingly seat against the valve seat and close the passageway, and means between the mounting and the valve head for unseating the valve head upon movement of the mounting and diaphragm in the direction as biased by the spring for opening the passageway, the improvement, comprising in combination therewith:

a. a spring seat mounted between the spring and the adjustment means, the spring seat being displaceable by the adjustment means through a path and range of travel for partially compressing the spring against the mounting;

b. an outer margin on the spring seat, the margin extending radially outward beyond the spring;



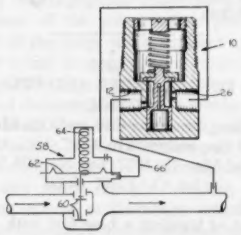
c. a limit stop mounted in the body and in the path of displaceable travel of the spring seat, the margin and limit stop being abuttable against each other prior to complete compression of the spring for terminating displacement of the spring seat and limiting compression of the spring; and

d. a rupturable center section in the spring seat and in engagement with the adjusting means, the center section being rupturable upon operation of the adjustment means in a direction toward the mounting when the margin and limit stop are abutted against each other.

4,111,223
CONTROL LINE RELIEF VALVE

Leland E. Gelnett, Du Bois, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sep. 27, 1976, Ser. No. 726,904
Int. Cl.[2] F16K *31/12*
U.S. Cl. 137—115 9 Claims



1. A relief valve comprising a body having a stepped blind bore longitudinally therein and inlet and outlet transverse passages intersecting the smaller diameter bore of said stepped bore, a valve member movable in said bore having a cylinder open on the bottom, a stem portion projecting coaxially from the closed end of said cylinder toward the open end of said stepped bore and carrying a flange engageable with the shoulder of said stepped bore when said valve member is in a first position, a cap closing said bore open end, a spring between said cap and said valve member biasing said valve member

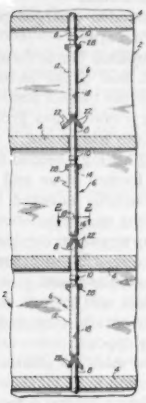
towards said first position, said valve member movable to a second position against said spring bias in which said flange is unseated from said shoulder, allowing communication between said smaller diameter and the larger diameter of said stepped bore, said inlet passage opening into said smaller diameter bore adjacent said closed end of said cylinder when said valve member is in said first position, said outlet passage opening into said smaller diameter bore intermediate said inlet passage opening and said shoulder of said stepped bore, bore means communicating the interior of said cylinder with the portion of said stepped bore between said cylinder and said flange, and vent means connecting said larger diameter bore with the atmosphere.

4,111,224

WATER DISTRIBUTION SYSTEM

Wayne Sandstrom, Box 2414, Fairbanks, Ak. 99707

Filed Apr. 29, 1976, Ser. No. 681,619
Int. Cl.[2] F16L *55/04*
U.S. Cl. 137—207 **4 Claims**



1. A water distribution system for a multi-storied building, comprising:

a continuous water supply conduit extending upwardly through said building;

means defining an upstanding closed chamber at each of said stories;

means for directing water from said supply conduit into each of said chambers at a level substantially below the top thereof whereby a body of air is trapped in the upper part of said chamber;

a plurality of water distribution conduits extending from one end of each of said chambers for supplying water therefrom to each of a plurality of locations at each of said stories, each of said distribution conduits communicating with said chamber below said level; and

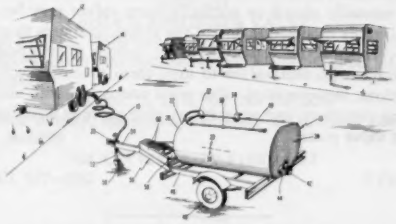
said means defining each of said chambers comprising a jacket member surrounding a portion of said continuous supply conduit and sealed thereto at upper and lower ends, the annular space between said supply conduit and jacket defining said chamber, said means for directing water into said chamber comprising at least one opening in the side of said supply conduit at said level in said chamber.

4,111,225

SEWAGE DISPOSAL METHOD AND SYSTEM

Charles W. Phelps, 235 Valley Ave., Williamsport, Pa. 17701

Filed Aug. 10, 1976, Ser. No. 713,206
Int. Cl.[2] B08B *9/08*
U.S. Cl. 137—240 **10 Claims**



1. A collection tank for sewage, comprising:

a tank body having an inlet for receiving sewage and an outlet for drainage;

nozzle means located within said tank adjacent an inner wall surface thereof, and directed so as to impinge a cleaning fluid on said inner wall surface, said nozzle means including a plurality of nozzles distributed along an upper portion of said tank body, each of said nozzles including a stem portion extending through the tank body and having discharge orifices adjacent said inner surface, said nozzle means further including a conduit disposed along an outer surface of said tank body interconnecting said nozzles; and

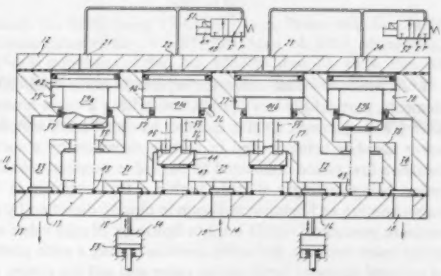
means for supplying the cleaning fluid to said nozzle means from a source of the fluid located outside said tank body.

4,111,226

MULTIPLE FUNCTION FOUR POPPET VALVE SYSTEM

Russell J. Cameron, Rochester, Mich., assignor to Ross Operating Valve Co., Detroit, Mich.

Filed Aug. 1, 1977, Ser. No. 820,617
Int. Cl.[2] F15B *13/00*; F16K *11/20*
U.S. Cl. 137—269 **7 Claims**



1. In combination, a valve body having an inlet port, a pair of working ports, and a pair of exhaust ports, an inlet chamber in said body connected to said inlet port, a pair of working chambers connected to said working ports respectively, and a pair of exhaust ports connected to said exhaust ports respectively, four main valve piston chambers formed in said body, four valve ports formed in said body and aligned with said piston chambers, two of said ports being disposed between said inlet chamber and said working chambers respectively and two ports between said working chambers and said exhaust chambers respectively, each port having valve seats on its opposite sides, a plurality of poppet valves of two types, one type being normally closed and the other normally open, each of said normally open valves comprising a piston and a valve portion

engageable with the downstream seat of a valve port, each of said normally closed valves comprising a piston and a valve portion engageable with the upstream seat of a valve port, seals carried by said body adjacent said piston chambers, said valves having portions engageable with said seals, said seal engaging portions and said piston portions on both the normally closed and normally open valves having a common diameter whereby the normally closed or normally open valves may be interchangeably mounted in any of the piston chambers to engage the corresponding valve port seats, springs in said body engageable with said valves to urge them toward deactivated positions, separate pilot valve ports connected with said four piston chambers, and at least one pilot valve controlling said pilot valve ports.

4,111,227

PRESSURE RELIEF VALVE FOR HYDRAULIC MINE SUPPORTING ELEMENTS

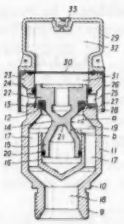
Siegfried Sigott; Heinrich Suessenbeck; Alfred Zitz, all of Zeitweg, and Gottfried Siebenhofer, Vienna, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Sep. 1, 1976, Ser. No. 719,653

Claims priority, application Austria, Sep. 9, 1975, 6947/75; Feb. 12, 1976, 1007/76

Int. Cl.² F16K *31/363*

U.S. Cl. 137—469 **11 Claims**



1. A pressure relief valve for hydraulic mine supporting elements, particularly mine props, comprising a valve housing having exit openings; a valve member having a valve seat; said valve member being loaded in closing direction by a spring means; a first piston connected to the valve member, said first piston being sealingly slidable within a first cylinder in the valve housing and being acted upon in closing direction by the pressure prevailing within a space upstream of said valve seat of the valve member, the valve member having a neck portion of reduced diameter between the valve seat and the piston, the annular cross section, being acted upon in closing direction, between the neck portion and the circumference of the piston being smaller than the annular cross section, being acted upon in opening direction, between the neck portion and the valve seat; and a second piston downstream of said valve seat and connected to said valve member, said second piston being of greater diameter than said valve seat and cooperating with said exit openings to clear these openings only after a predetermined valve stroke in the opening direction, said second piston defining with said valve housing a space which in the closed position of said valve member exists between said valve seat and said exit openings, said valve housing having at least one bore which places said space in communication with the atmosphere thereby preventing oscillations of the valve member.

4,111,228

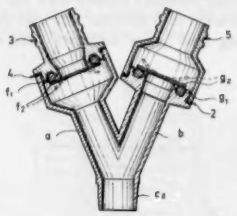
RESPIRATORY VALVE, ESPECIALLY FOR ANAESTHETIC CIRCUITS

Radu Simionescu, Bucharest, Rumania, assignor to Institutul Oncologic Bucuresti, Bucharest, Romania

Continuation-in-part of Ser. No. 598,360, Jul. 23, 1975, abandoned. This application Dec. 28, 1976, Ser. No. 754,992

Int. Cl.² F16K *15/14*

U.S. Cl. 137—512 **4 Claims**



1. A respiratory valve for use in the circuits of anaesthetic gas devices, comprising:

first and second tubular arms joined in a union with a tubular mouthpiece, said first and second arms forming a bifurcated breathing chamber;

a first internally threaded enlarged portion formed at the free end of said first arm;

a first externally threaded flange formed at the free end of said second arm, said flange having an annular recess formed in the end face thereof concentric with an annular extension having a continuous groove in the periphery thereof opening into said recess;

a first tubular fitting having a second flange identical to said first flange and formed at an end thereof, said second flange being threadedly engaged in said first enlarged portion with sealing means therebetween;

a first shutter having a resilient toroidal ring formed with an inwardly projecting rib, said ring being removably mounted in said annular recess in said second flange with said rib engaged in said groove and a resilient circular membrane overlying said ring and mounted thereon at two diametrically opposite points defining two deflectable circular segments, said first shutter being housed in said first enlarged portion in an inhalation mode;

a second tubular fitting having a second enlarged portion formed at an end thereof and identical to said first enlarged portion, said second enlarged portion being threadedly engaged on said first flange with sealing means therebetween

a second shutter identical to said first shutter, mounted in said annular recess of said first flange in an identical manner to the mounting of said first shutter, said second shutter being housed in said second enlarged portion in an exhalation mode; and

circular lugs formed on the outer periphery of said first and second fittings for engagement with said circuit.

4,111,229

CONTROLLING THE FLUID IN A BALL VALVE

Timothy T. Christian, 24243 Ocean Ave., Torrance, Calif. 90505

Filed Apr. 1, 1977, Ser. No. 783,551

Int. Cl.² F16K *5/10*

U.S. Cl. 137—614.17 **3 Claims**

1. An improvement for controlling the flow of fluid in a conduit to be used in combination with a ball valve which includes:

a. a valve body having a bore extending therethrough, said valve body having an inlet and an outlet which are axially aligned and adapted to be mechanically coupled to the

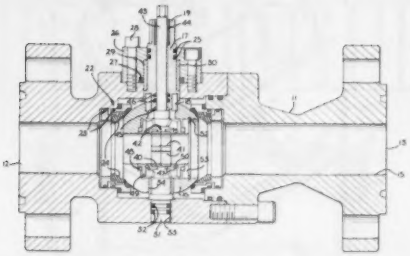
conduit and said valve body also having an aperture therein;

b. a spherical valve member having a port, the axis of which is alignable with the axis of the bore of said valve body;

c. a stem having an inner end mechanically coupled to said spherical valve member and an axially outer end which extends through the aperture of said valve body; and

d. sealing means for forming a seal between the aperture of said valve body and said stem, said improvement comprising:

a. a pair of disc carriers disposed within the port of said valve member;



b. a pair of discs, each of said discs being carried by one of said disc carriers with the respective discs being disposed in a contiguous relation, said discs having orifices therethrough which are movable in and out of alignment; and

c. rotating means for rotating one of said disc carriers relative to the other of said disc carriers, said rotating means mechanically coupled to said stem in such a manner that said discs are moved in and out of alignment in order to control the flow of fluid from the inlet to the outlet of said valve body.

4,111,230

SERVO-CONTROLLED VALVE

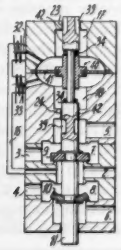
Harald Stampfli, Petit-Saconnex-Geneva, Switzerland, assignor to Lucifer S.A., Carouge-Geneva, Switzerland

Filed Mar. 15, 1977, Ser. No. 777,671

Claims priority, application Switzerland, Mar. 23, 1976, 3596/76

Int. Cl.[2] F15B *13/043*

U.S. Cl. 137—625.5 **4 Claims**



1. In a servo-controlled valve comprising at least two valve members cooperating with respective seats and mounted on a rod axially movable between two stable positions, two servo-control chambers, means for alternately filling said chambers with fluid under pressure to initiate said axial movements of the rod from one of said stable positions towards the other, and an arrangement for sustaining movement of said rod towards said other position when during operation the rod reaches an unstable position between said stable positions, the improvement wherein each of the servo-control chambers has means defining an emptying orifice and an obturator cooperating with said orifice, said obturator being operatively connected to the rod to open the orifice and produce emptying of the chamber filled with fluid under pressure as soon as the rod passes said intermediate unstable position during its movement from one stable position towards the other.

4,111,231

SHOCK ABSORBER VALVE

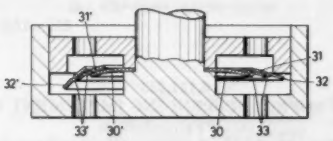
Erhard Leppich, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,523

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1976, 2600820

Int. Cl.[2] F16F *9/34*; F16K *15/14*

U.S. Cl. 137—852 **5 Claims**



1. In a valve, usable in a shock absorber for controlling flow of a fluid through a valve support member having a fluid passage, said valve comprising a valve seat and a plurality of disk springs cooperating therewith, the improvement wherein a first disk spring is clamped in the region of a first radial edge and extends in the radial direction toward said valve seat, its second radial edge terminating before reaching said valve seat and being free to flex in either axial direction, and wherein a second disk spring is held in the region of a first radial edge against the pressure of the fluid medium only at the region of said second radial edge of said first disk spring, the second disk spring extending in the radial direction toward the valve seat such that its other second radial edge extends over said valve seat and lies in contact therewith when the valve is closed.

4,111,232

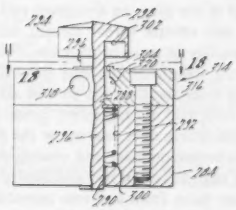
SAFETY MECHANISM FOR PRESSES, MACHINES AND FIXTURES

Robert W. Williamson, 77 Cedar Acres, Brunswick, Ga. 31520

Continuation of Ser. No. 577,290, May 14, 1975, abandoned, which is a division of Ser. No. 435,900, Jan. 23, 1974, Pat. No. 3,884,336. This application Jan. 18, 1977, Ser. No. 760,414

Int. Cl.[2] F16K *1/00, 13/02*

U.S. Cl. 137—882 **10 Claims**



1. A failsafe valve means for use in a safety apparatus or the like for determining when two components of the apparatus are in a predetermined relationship and providing a control signal in response to such predetermined relationship, comprising a valve body fixed relative to a first of said components, a first passage formed in said valve body and terminating at one end in a first port normally communicating with the atmosphere, the other end of said first passage being in communication with a source of pneumatic pressure, a second passage formed in said valve body and terminating at one end in a

second port normally communicating with the atmosphere, the other end of said second passage being in communication with a device adapted to receive pneumatic pressure when the two components are in the predetermined relationship and a valving member supported for movement relative to said valve body between a closed position and an opened position, the movement of said valving member between the positions being controlled by the other of said components, said valving member being adapted, when in its closed position, to terminate the communication of said ports with the atmosphere and to provide a flow path between said ports for establishing a pneumatic circuit between said first passage and said second passage and permitting the transmission of said control signal from said first passage to said second passage.

4,111,233

WATER SUPPLY SUSPENDING IMPLEMENT WITH STOPPING PIECE

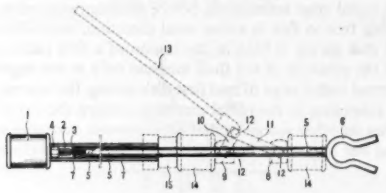
Kurioka Takashi, 15-15, 1-chome, Higashinakamoto, Higashinariku, Osaka, Japan

Filed Apr. 12, 1977, Ser. No. 786,843

Claims priority, application Japan, Apr. 13, 1976, 51/46507[U]

Int. Cl.[2] F16L *55/10*

U.S. Cl. 138—89 **1 Claim**



1. A device for stopping the flow of water through an open pipe, comprising: an expandable plug formed of elastic material; a screw having a normal screw thread extending axially from said plug; a second screw of smaller diameter than said first screw and extending axially from the end of said first screw, said second screw having a reverse screw thread; a nut screw-fitted on said normal screw thread and adapted to contact the end of the plug; an elongated rod axially screwed to the end of said reverse screw thread, said elongated rod extending outwardly in an axial direction from said plug and having a turning handle at the end thereof; an outer tube loosely inserted over the forward part of said elongated rod and extending over said normal screw thread and said reverse screw thread and fitting over said nut at the tip end thereof; a pair of forced-contact opening and closing elements slidably extending over said elongated rod and axially spaced from the end of said outer tube; front and rear movable links hingedly attached one to each of said pair of forced-contact elements, with the other ends of said links hinged together; a guide arm fixed to one side of said links; elastic buffer tubes slidably provided on said elongated rod, one located between the rearmost of said forced-contacting opening and closing elements and said turning handle, and the other between the frontmost of said forced-contacting opening and closing elements and the end of said outer tube; and means for adjusting the degree of expansion of said plug, said means comprising at least one adjusting ring slidably placed on said elongated rod between the end of said outer tube and said elastic buffer tube.

4,111,234

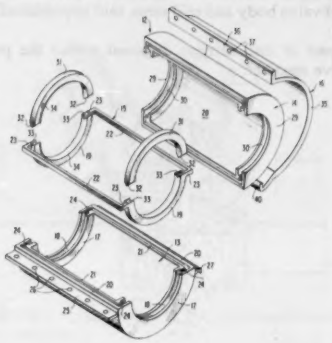
REPAIR DEVICE FOR PIPES

James W. Wells, Rte. 1, Box 771, Elmore, Ala. 36025, and Loyd A. Watts, Rte. 2, Box 303, Wartrace, Tenn. 37183

Filed Nov. 11, 1976, Ser. No. 740,942

Int. Cl.[2] F16L *55/16, 55/18*

U.S. Cl. 138—99 **10 Claims**



1. A repair clamp for pipes and pipe couplings comprising a pair of rigid mating separately formed approximately semi-cylindrical clamp sections having arcuate end walls at opposite ends with interior faces defining openings of a diameter substantially less than the diameter of the semi-cylindrical clamp sections and engageable around a leaking pipe or pipe coupling to enclose and seal the pipe permanently in the region of the leak, said pair of semi-cylindrical clamp sections being of the same diameter as the arcuate end walls throughout the lengths thereof thereby adapted to form an enclosed cavity around a pipe, gasketing disposed at the interfaces of said clamp sections and at the interfaces of the interior faces of the end walls with the pipe to seal such interfaces, a radial flange on the exterior of one clamp section positioned at one longitudinal edge thereof and an interlocking engagement means on the opposite longitudinal edge thereof, an arcuate connector member separate from said clamp sections having an opposing radial flange on the exterior thereof on one longitudinal edge and a rigid interlocking engagement means substantially diametrically spaced therefrom adapted to interlock with said first mentioned interlocking engagement means on said one clamp section, said arcuate connector member extending substantially around the opposing clamp section circumferentially and engaging the circumferential face thereof substantially throughout its circumferential length in force transferring relationship, said opposing clamp section being free of radial flanges on both exterior longitudinal edges thereof, and adjustable connecting means between said radial flange on said one clamp half section and said opposing radial flange on said arcuate connector member, whereby said clamp is adapted to be clamped on a pipe by lateral swinging movement of said arcuate connector member about said interlocking engagement means and actuation of said adjustable connecting means.

4,111,235

PIPE CAP

Charles Alexander Gray, Cypress, Calif., assignor to BJ-HUGHES Inc., Long Beach, Calif.

Filed Jul. 6, 1976, Ser. No. 702,557

Int. Cl.[2] F16L *21/02*

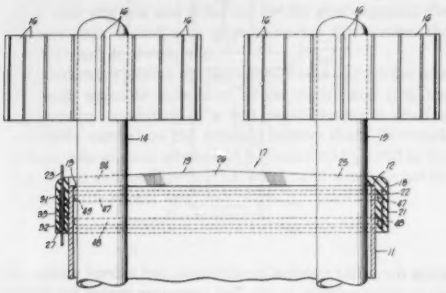
U.S. Cl. 138—109 **10 Claims**

1. The combination with the open end of a cylindrical tubular member that has a pipe of smaller diameter projecting through its open and of a sealing cap installed over the open end of said cylindrical tubular member and surrounding said pipe for sealing said pipe to said member, said cap comprising:

an elastomeric discoid portion covering the open end of said tubular member and having wall means defining an aperture and closely encircling said pipe of smaller diameter;

a cylindrical, elastomeric apron extending from said discoid portion and closely encircling said tubular member adjacent to its open end;

said apron and said discoid portion having mutually abutting walls defining a split extending from the free edge of said apron, through said apron and through a part of said discoid portion to intersect said wall means defining said aperture;



a flexible, cylindrical band embedded in said apron and defining a split substantially aligned with the section of said split that extends through said apron; and

securing means disposed at one side of said aperture, operative between the ends of said band adjacent to its said split, and drawing the ends of said band relatively together thereby compressing said apron into tight engagement with said tubular member, and pressing said walls of said split together and said wall means defining said aperture into tight engagement with said pipe of smaller diameter.

4,111,236

TRANSMISSION LINE CARRIER

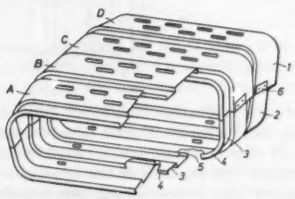
Werner Moritz, Siegen, Fed. Rep. of Germany, assignor to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,171

Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622005

Int. Cl.² F16L *11/18*

U.S. Cl. 138—120 **9 Claims**



1. A self-supporting transmission line carrier between a moveable consumer and a stationary connection comprising

a row of tubular members of any selected cross-sectional shape operatively pivotally connected relative to one another and engaging in one another, said tubular members bending relative to one another from an extended position thereof only in one direction,

each of said tubular members being formed on one end with an inwardly directed rimming, circulatory channel having an outwardly directed angled-off edge forming an inner abutment,

each of said tubular members being shorter at the other end on one half thereof by the width of said channel and having a circulatory inwardly directed angled-off edge forming an outer abutment, the bending of the tubular members being limited relative to one another by means of said abutments,

each two adjacent of said tubular members engaging behind one another with said inner and outer abutments, the latter moveably disposed relative to one another, and the bending being limited thereby to a maximum by the width of said channel.

4,111,237

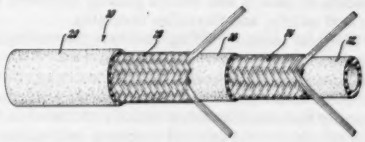
BRAID REINFORCED FLEXIBLE BRAKE HOSE

John E. Mutzner, Covington, and Gary P. Ford, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 12, 1976, Ser. No. 704,663

Int. Cl.² F16L *11/04, 11/08*

U.S. Cl. 138—125 **3 Claims**



1. A hydraulic brake hose comprising

an elastomeric core tube,

a reinforcing braid of twisted glass fiber yarn wound around said tube braided at an angle of about 52° to 56° to the axis of the tube,

an elastomeric cushion layer covering said glass braid,

reinforcing braid of untwisted nylon fibers over said cushion layer, and

an elastomeric cover layer.

4,111,238

APPARATUS FOR CONTROLLING SHED FORMATION IN A TRAVELLING-WAVE LOOM

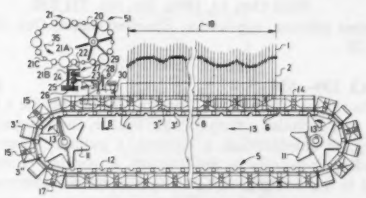
Ladislav Bezstarosti; Antonin Lindental; Jiri Lanta, and Jaroslav Cizek, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 4, 1976, Ser. No. 729,202

Claims priority, application Czechoslovakia, Oct. 3, 1975, 6700/75

Int. Cl.² D03D *47/26*

U.S. Cl. 139—436 **8 Claims**



1. In a travelling wave shedding loom, an apparatus for forming a travelling wave shed from warp threads threaded in heddles, the shed waves travelling one after the other across the loom, in the regions of maximum amplitude of said shed waves one part of the warp threads being in lower dead center position and the other part being in an upper dead center position, the apparatus comprising, in combination,

at least two heddle rows arranged one after the other in the weaving region of the loom, the heddles in each row being arranged side-by-side;

heddle holders in each heddle row, said holders being movable independently of one another into lower and upper dead center position to form the shed wave;

an array of guiding members associated with each heddle row;

means for moving the guiding members in sequence across the loom;

a pair of superposed upper and lower guiding track sections provided in each guiding member, the respective upper and lower guiding track sections of all guiding members in each array forming together upper and lower tracks for controlling the strokes of the heddle holders to form a wave shed, the lower guiding track being adapted to guide the heddle holders into the lower dead center position and the upper guiding track being adapted to guide them into the upper dead center position;

in each array of guiding members there being first guiding members provided with vertically spaced horizontal guiding track sections and second guiding members provided with two guiding cam track sections, said guiding cam track sections converging from both sides towards the middle of each of said second guiding members, crossing at said middle, and thereafter diverging,

the first and second guiding members alternating in each array;

butts provided on the heddle holders to engage the respective one of the guiding tracks;

vertically reciprocable sliders slidably mounted in the middle of said second guiding members, said sliders having three superposed systems of connecting tracks for three alternative modes of interconnecting the guiding cam track sections at both sides of the slider in the three operative positions of the slider;

means for selectively adjusting the slider according to a program into said three operative positions, in the first central operative position of which the upper guiding cam track sections as well as the lower guiding cam track sections at either side of the slider being interconnected, in the second operative position of the slider the upper guiding cam track section upstream of the slider being interconnected with the lower guiding cam track section downstream of the slider, and in the third operative position of the slider the lower guiding cam track section upstream of the slider being interconnected with the upper guiding cam track section downstream of the slider.

4,111,239

APPARATUS FOR RELEASABLY SECURING A FLUID-OPERATED GRIPPER SHUTTLE IN A LAUNCH POSITION

Vladimir Svatý, Liberec, Czechoslovakia, assignor to Elitex, Koncern textilního strojirenstvi, Liberec, Czechoslovakia

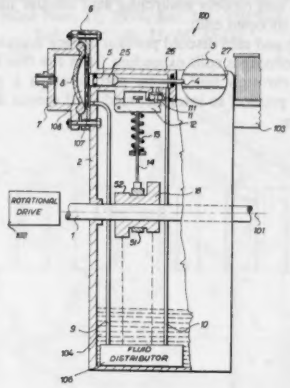
Filed Oct. 12, 1976, Ser. No. 731,830

Claims priority, application Czechoslovakia, Oct. 10, 1975, 6855-75

Int. Cl.[2] D03D *49/24*

U.S. Cl. 139—438 **6 Claims**

1. In a fluid-actuated weft insertion apparatus for a weaving loom that includes a reciprocable shuttle, the apparatus comprising, in combination, a housing, a cylinder disposed and extending forwardly in the housing, a working chamber disposed in the housing, and having a front end communicating with a rear end of the cylinder, a piston rod supported for reciprocation in the cylinder and coupled to the shuttle for launching the shuttle when the piston rod is moved forwardly in the cylinder from a rear-most position thereof, a piston secured to the rear portion of the piston rod, a collar secured to and extending rearwardly from the piston, releasable locking means supported in the working chamber ad engageable with the collar for movement between a first rear position for immobilizing the then-engaged collar and a second front position for releasing the collar so that the piston rod may thereafter be propelled in a forward direction when a fluid pressure differential is established between the working chamber and in the cylinder forwardly of the front end of the piston, first mechanical means disposed in the housing for cyclically operating the locking means from its first to its second position



while the collar remains immobilized, and second means operable in timed relation to the first operating means for establishing said fluid pressure differential to initiate a launch of the shuttle.

4,111,240

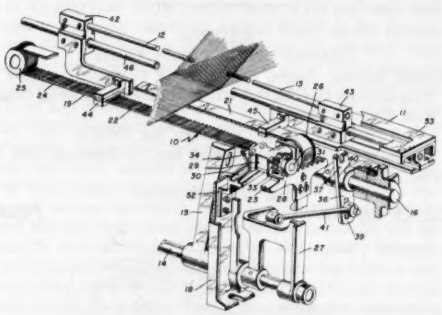
LOOM DRIVE MECHANISM

Robert G. Mallard, Hopedale, Mass., assignor to Bob Mallard Enterprises, Inc., Hopedale, Mass.

Filed Jan. 3, 1977, Ser. No. 756,020

Int. Cl.[2] D03D *47/00*

U.S. Cl. 139—449 **8 Claims**



1. Rapier drive mechanism for a textile loom having a pair of transversely-slidable rapiers capable of movement for transferring the weft yarn from side to side of the loom, comprising:

(a) an endless belt mounted in the loom and having upper and lower runs which extend horizontally across and under the lay, the upper run being connected to one rapier and the lower run being connected to the other rapier to produce the weft-transferring movement, the belt being formed with teeth on its inner surface and passing over an idler sprocket located at one side of the loom and over a drive sprocket at the other side of the loom,

(b) operating means bringing about alternate movement of the belt in one direction to bring the rapiers toward one another and in the other direction to move the rapiers apart, the said means bringing about a dwell in the belt and rapier movement when the rapiers have moved to the position at which they are farthest apart, the said means is being connected to the drive sprocket to rotate the same,

the said means rotating the drive sprocket through a cycle that includes rotation in one direction, a dwell, and rotation in the other direction, the cycle taking place in the same period of time as a cycle of the lay, the means including a rocker arm that is mounted at one end on the lay sword rocker shaft for swinging movement and has a gear segment mounted at the other end,

(c) a right-angle transmission mounted on the loom lay with an input shaft whose axis extends transversely of the loom and with the axis of the drive sprocket and which is drivingly connected thereto, the input shaft having a pinion gear that engages and is driven by the gear segment, the transmission including a geneva device that causes the output shaft to dwell, and

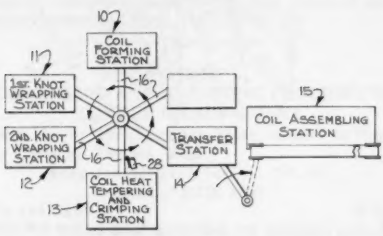
(d) a connection joining the lay sword to the said rocker arm to cause opposite movement of the sword and arm, the connection consisting of a bell crank having a bearing rotatably carried on the rotating bottom shaft, the crank having one portion whose end is connected by a rod to the lay sword and another portion whose end is connected by a rod to the rocker arm.

4,111,241

SPRING FORMING MEANS IN AUTOMATIC COIL SPRING ASSEMBLING MACHINE

Barry S. Crown, Chicago, Ill., assignor to Burton-Dixie Corporation, Chicago, Ill.

Filed Jun. 29, 1977, Ser. No. 811,056
Int. Cl.[2] B21F *27/16*
U.S. Cl. 140—92.7 **8 Claims**



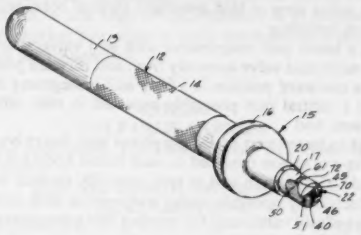
1. In an automatic machine for the production of assemblies of coil springs wherein wire is fed to a coiling station whereat individual coil springs are successively formed and severed from the wire, transport arm means are provided for delivering the coil springs one at a time to an assembling station, and means are provided in the assembling station for tying the individual coil springs into complete assemblies, the improvement comprising means for automatically forming an indentation in the opposite end convolutions of each coil spring, said indentation means being located in the path of movement of said transport arm between said coiling station and assembling station, said indentation means including dies positioned on opposite sides of said path of movement for receipt of each coil spring carried by said transport arm, means for temporarily stopping said transport arm movement when a coil spring held thereby is received by said dies, said dies including reciprocally movable forming members for engaging said end convolutions to form said indentations, and means for restarting said transport arm movement after formation of said indentations for movement to said assembling station whereby each coil in said complete assemblies includes said indentations.

4,111,242

WIRE WRAPPING AND CUT-OFF TOOL

Ronald H. Jacobson, 1055 Valley Lake Dr., Inverness (Palatine), Ill. 60067, and Brian J. Miller, 4519 N. Moody, Chicago, Ill. 60630

Filed May 24, 1977, Ser. No. 799,941
Int. Cl.[2] B21F *3/00, 15/00*
U.S. Cl. 140—124 **3 Claims**



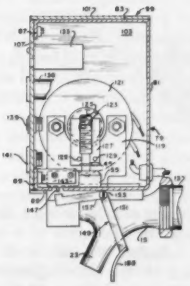
1. In a wire wrapping tool having an axial end face with a bore therein for receiving a terminal pin around which a wire is to be wrapped and an end face configuration adapted to cause a wire to wrap around the pin upon rotation of the tool, the improvement of a blind slot extending partially through a body of the tool less than the full width of the body having one slot end open to the axial end face adjacent the bore and another slot end open to a periphery of the body spaced from the axial end face with a throat opening to the slot at the periphery of the axial end face, the body being elongated and the slot extending into the body transversely of the longitudinal extent thereof terminating interiorly of the body, the slot having a wire positioning means such that when a wire is received in the slot with wire ends exiting the slot at both the axial end face and at the periphery, the slot wire positioning means will prevent wire movement towards the throat when the wire is positioned at a certain point in the slot and when the wire projecting from the periphery undergoes movement towards the axial end face.

4,111,243

BEVERAGE DISPENSING DEVICE

Charles P. Fetterman, Kirkwood, Mo., assignor to Consumers Digital Systems Corp., St. Louis, Mo.

Filed Jun. 25, 1976, Ser. No. 699,893
Int. Cl.[2] B65B *3/36*; B67D *5/08*
U.S. Cl. 141—102 **12 Claims**



1. An easily disassembled and cleaned dispensing device for automatically dispensing a pressurized beverage, said device comprising:

(a) a faucet body having a passageway therethrough, said passageway including a generally horizontal bore having an inlet, an inlet, an outlet spout communicating with said

inlet and a valve seat in said horizontal bore between said inlet and said outlet spout;

(b) a valve assembly slidably mounted in said horizontal bore, said valve assembly including means cooperative with said valve seat for closing said passageway when said valve assembly is in a forward position;

(c) a generally vertical bore in said body communicating with said generally horizontal bore, said generally vertical bore including means forming a valve stem seat;

(d) a valve stem in said generally vertical bore, said valve stem including

(i) a lower part cooperative with said valve assembly to move said valve assembly from said forward position to a rearward position in which said passageway is open;

(ii) a central part pivotably mounted in said valve stem seat; and

(iii) an upper part extending above said faucet body;

(e) cap nut means mounted on said faucet body for holding and valve stem in said in said generally vertical bore;

(f) electrically operable means cooperative with said upper part of said valve stem for opening said passageway in said faucet body;

(g) housing means for carrying said electrically operable means, said housing means comprising a lower wall having slots therein; and

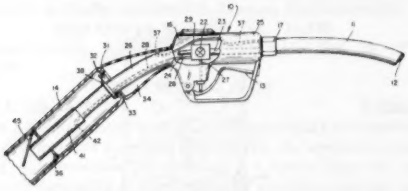
(h) coupling means on said faucet body for releasably mounting said housing means on said faucet body with said electrically operable means positioned to cooperate with said upper part of said valve stem, said coupling means being so proportioned and constructed as to permit removal of said cap nut means and removal of said valve stem from said generally vertical bore in said faucet body when said housing means are released and removed from said mounting means, said coupling means comprising a plurality of ears, each ear comprising a vertical riser part and a horizontal flap part, said ears extending through said slots in said lower wall of said housing means with said flap parts overlying said lower wall when said housing means are mounted on said faucet body, said ears and said slots forming a quick-disconnect coupling releasable by lateral movement of said housing means with respect to said faucet body.

4,111,244

EXTENDABLE FUEL DISPENSING NOZZLE

Eugene W. Vest, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed May 19, 1976, Ser. No. 687,855
Int. Cl.[2] B65D *29/02*
U.S. Cl. 141—348 **4 Claims**



1. A fuel dispensing nozzle having a discharge tube adapted to sealably engage the filler pipe of a tank to be filled, said discharge tube including a liquid level sensing means positioned therein and having an elongated sensing conduit (28) with a sensing end thereof disposed adjacent to the discharge tube open end, said sensing conduit being communicated with a pressure sensitive element in said nozzle capable of automatically discontinuing fuel flow through the nozzle when fuel in the filler pipe rises a sufficient distance to cover said sensing conduit end, said filler pipe including a baffle plate disposed transversely thereof, and means forming an aperture in said baffle plate sufficiently large to register the remote end of a discharge tube therethrough, the improvement in said nozzle to allow introduction of fuel into said filler pipe at a point downstream of said baffle plate which comprises;

a discharge tube extension sleeve longitudinally slidably carried on the external surface of said discharge tube and having guide means on the inner surface thereof, and being adapted to be adjusted on said discharge tube between extended and retracted positions,

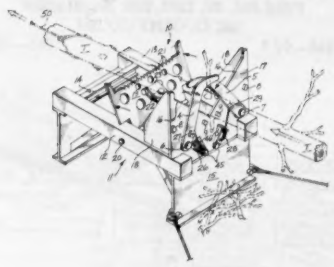
whereby in the extended position said extension sleeve will register within said baffle plate aperture to permit the introduction of a flow of fuel into said tank without said fuel accumulating upstream of the baffle plate prior to the tank becoming filled, said end of said sensing tube traversing a wall of said discharge tube, and having sliding engagement with said extension sleeve guide means to guidably regulate movement of the sleeve between the extended and retracted positions thereof.

4,111,245

TREE DELIMBER

Carl M. McCrary, Kalama, and Robert D. Larsen, Kelso, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash., by said Carl M. McCrary

Filed Dec. 23, 1976, Ser. No. 754,058
Int. Cl.[2] B27L *1/00*
U.S. Cl. 144—2 Z **5 Claims**



1. A tree delimber for delimbing trees pulled substantially horizontally through the delimber, comprising:

a base;

a lower impact shear blade, comprising a notched plate such that a tree resting in the notch is substantially bounded about its lower half circumference by the notch, said plate fixed to the base substantially vertically and transverse to the travel of the tree through the delimber;

upper impact shear blades, comprising a pair of arcuate arms pivotally mounted upon said base, arranged wherein a tree resting in the lower shear blade is substantially bounded about its upper half circumference by the pair of arms pivoted into contact with said tree;

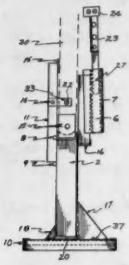
an activating plate pivotally fixed to the base, axially displaced from said upper and lower blades, said activating plate arranged such that the travel of the tree through the delimber contacts said plate causing it to pivot in response to said tree; and

a means for interconnecting the activating plate with said upper impact shear blades, wherein a tree contacting said lower blade and activating plate causes the upper blade arcuate arms to pivot into bounding contact with the upper half circumference of the tree.

4,111,246
LOG-SPLITTING ACCESSORY FOR BACK HOE POWER EQUIPMENT

Roland La Pointe, Rte. 2, Winthrop, Me. 04364

Filed Jan. 5, 1977, Ser. No. 756,951
Int. Cl.[2] B27L 7/00
U.S. Cl. 144—193 A 3 Claims

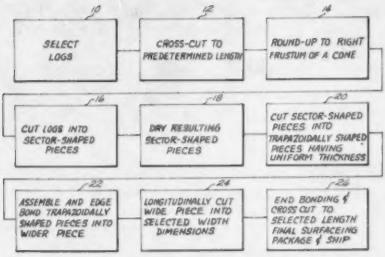


1. A log-splitting apparatus that is an accessory to back hoe equipped power equipment of the type having a boom member, a stick member pivotally attached to said boom member and a piston member mounted parallel to said stick member, said apparatus comprising:
a base;
an upright member affixed to said base;
connecting means for affixing said upright member to the stick member of said back hoe;
a wedge member;
means to affix said wedge member to said piston member;
rail means affixed to said upright member for guiding said wedge member; and
an elongated stabilizing bar affixed to said back hoe's stick member adapted to contact said upright member in overlapping relation with said connecting means of said upright member and stick.

4,111,247
LOG CUTTING AND REJOINING PROCESS FOR LUMBER MANUFACTURE

Earl Dean Hasenwinkle, Longview, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 13, 1977, Ser. No. 759,166
Int. Cl.[2] B27K 1/08
U.S. Cl. 144—316 23 Claims

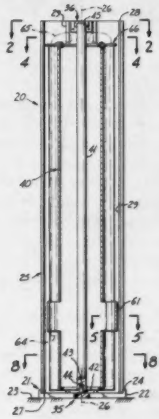

10
SELECT LOGS
12
CROSS-CUT TO PREDETERMINED LENGTH
14
ROUND-UP TO RIGHT FRUSTUM OF A CONE
16
CUT LOGS INTO SECTOR-SHAPED PIECES
18
DRY RESULTING SECTOR-SHAPED PIECES
20
CUT SECTOR-SHAPED PIECES INTO TRAPAZOIDALLY SHAPED PIECES HAVING UNIFORM THICKNESS
22
ASSEMBLE AND EDGE BOND TRAPAZOIDALLY SHAPED PIECES INTO WIDER PIECE
24
LONGITUDINALLY CUT WIDE PIECE INTO SELECTED WIDTH DIMENSIONS
26
END BONDING & CROSS CUT TO SELECTED LENGTH FINAL SURFACEING PACKAGE & SHIP

1. A process for making a composite lumber product having substantially flat grained parallel top and bottom surfaces, comprising:
cutting from at least one log at least one elongated sector-shaped piece,
cutting from said sector-shaped piece at least one elongated member having at least three sides with two of said sides being edges and portions of the radial faces and the other sides being substantially parallel to an elongated plane through the chord of said sector-shaped piece, said member having a thickness dimension extending perpendicular from one of said other sides to a location on a plane parallel to said other sides and which passes through the ends of the two side edges and being substantially equal to the thickness dimension of said composite wood product, and
accumulating a plurality of said elongated members, with at least one of said members being trapezoidally shaped in cross-section, and bonding them together one to another, such that a side edge of each member is in juxtaposition with another side edge to form substantially a parallelogram in cross-section.

4,111,248
GOLF CLUB CARRIER

Harold A. Leichhardt, 178 Desert Lakes Dr., Palm Springs, Calif. 92262

Filed Jun. 20, 1977, Ser. No. 808,199
Int. Cl.[2] A63B 55/00
U.S. Cl. 150—1.5 R 12 Claims



1. A golf club carrier comprising:
a support; and
a club holder having an axis of rotation, said club holder being axially elongated and mounted to said support for rotation around a central axis, said club holder including a plurality of retention means to receive and hold a golf club handle which retention means are laterally spaced from said axis whereby to move circularly around said axis when the club holder is rotated, said support being so constructed and arranged as to give access to a club held by each retention means in at least one respective position to which the club holder can be turned, each said retention means comprising a socket member into which the handle of a club can be placed, and head holding means to hold the head to the club holder, said club holder including a peripheral wall having an axial groove to receive a club handle, a portion of said wall being formed outwardly of the remainder of the groove to form said socket.

4,111,249
BAND REINFORCED RADIAL TIRE

Edward G. Markow, Oakdale, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

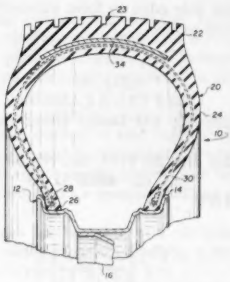
Filed Nov. 8, 1976, Ser. No. 739,559
Int. Cl.[2] B60C 17/00
U.S. Cl. 152—330 RF 5 Claims

4. In a pneumatic tire:
a casing having a crown, sidewalls, and annular bead portions, said sidewalls extending from said crown on either

side thereof to said annular bead portions, said bead portions being adapted to mount said tire on the rim of a wheel;

a solid resilient annular element fixed in said tire in the crown region thereof, said annular element extending substantially from sidewall to sidewall;

means to stabilize said annular element, said means comprising a multiplicity of substantially radial spoke-like reinforcing elements having freedom in shear with respect to



one another in said sidewalls, said radial elements being in close proximity in the crown of said tire to said annular element and operatively connected thereto at least in part through said casing, whereby when said tire is operated underinflated said annular element functions as a structural flexible-arch compression member wherein said arch configuration allows coacting tension loads in the sidewalls to act over a substantial portion of the circumference of the sidewalls.

4,111,250

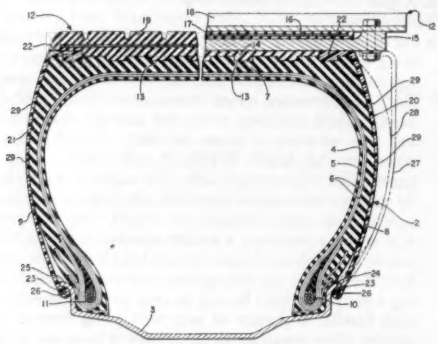
SIDEWALL PROTECTOR

John R. Bauer, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 24, 1976, Ser. No. 726,324

Int. Cl.[2] B60C *5/18*

U.S. Cl. 152—187 **6 Claims**



1. In an assembly of a wheel rim with upstanding rim flanges and a tire comprising: a tire carcass, including at least one layer of reinforcement cords; a traction element and a pair of sidewalls which at least partially surround the carcass and terminate at at least one pair of inextensible beads; the improvement comprising a non-rigid annular shield for protecting at least one of the sidewalls of the tire against punctures, the shield being separate from the sidewall and not adhered thereto such that stresses experienced by the sidewall during flexing of the tire will not be imparted to the shield, the shield being dimensioned to completely cover the sidewall between the traction element and adjacent rim flange, the shield having concentric, radially spaced inner and outer circular marginal edges, means at the radially outer marginal edge of the shield for securing the shield to the tire adjacent the traction element, and a substantially inextensible reinforcement embedded in the radially inner edge of the shield, said inner circular marginal edge being positioned adjacent the outer edge of the upstanding rim flange for mating interlocking engagement with said adjacent upstanding rim flange and mounting of the shield without stretching of said inner edge over said rim flange.

4,111,251

NET- OR CHAIN-LIKE VEHICLE TRACTION DEVICE FOR VEHICULAR WHEELS

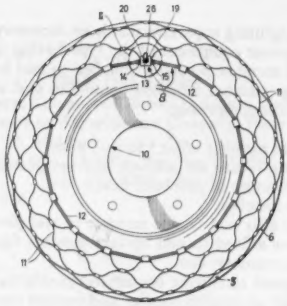
Karl Bula, Seuzach, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Feb. 22, 1977, Ser. No. 771,171

Claims priority, application Switzerland, Feb. 24, 1976, 2246/76

Int. Cl.[2] B60C *27/10*

U.S. Cl. 152—219 **7 Claims**



1. A vehicle traction device for installation on a ground-engaging rotatable wheel of a vehicle, comprising:

(A) traction means for placement on said wheel for increasing traction between the outer peripheral surface of the wheel and the ground upon rotation of the wheel about its axis of rotation;

(B) a tightening mechanism effective at least at one side of the wheel in the peripheral direction thereof for tightening said traction means;

(C) said tightening mechanism comprising:

(a) a tensioning element extending in said peripheral direction and constructed to be elastic at least over a part of its extent;

(b) a tightening wire extending in said peripehral direction and having two ends;

(c) tightening lock means

(D) said tightening lock means comprising:

(a) a body member;

(b) at least one blocking element movable between an inclined position and a substantially upright position arranged in said body member;

(c) one end of said tightening wire being attached to said tightening lock means;

(d) said blocking element having receiving means through which there is guided the other end of said tightening wire;

(e) an unlocking element cooperating with said blocking element for moving said blocking element from said inclined position into said upright position;

(f) said blocking element permitting relative displacement of the tightening lock means and the tightening wire in one direction only in the sense of decreasing the effective length of the tightening wire when the vehicle

traction device is installed at the wheel and with said blocking element in said inclined position;

(g) said unlocking element being movable from a locking position where said blocking element is in said inclined position into an unlocking position where the blocking element is in said upright position for releasing the tightening wire such that there is possible relative displacement of the tightening lock means and said tightening wire in a direction which is opposite to said one direction;

(h) said unlocking element, when mounting the tensioning element and the tightening wire in the peripheral direction of the wheel, constituting a member separate from said blocking element; and

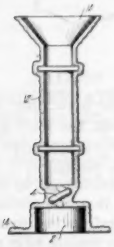
(i) said separate member constituting said unlocking element being pivotable about the tightening wire and having a substantially wedge-shaped projection for unlocking the blocking element by shifting said blocking element into said upright position.

4,111,252

METHOD FOR MAKING MOLDS AND MOLD COMPONENTS FOR CASTING SINGLE CRYSTAL METALLIC ARTICLES

Edward G. Day, Rocky Hill, and Edmund Dziobek, Terryville, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 1, 1977, Ser. No. 820,659
Int. Cl.[2] B22C *9/04, 7/00*; B22D *15/02*
U.S. Cl. 164—23 **9 Claims**



1. In making ceramic mold means for casting single crystal metallic articles, the improvement comprising:

(a) providing a preformed and reusable replica of a mold growth cavity and crystal selector passage, said replica including a cylinder of predetermined size to form said growth cavity and a helical strand of preselected configuration to form said crystal selector passage, the strand having a small cross-section compared to that of the cylinder and having one end attached to one end of the cylinder such that the longitudinal axis of the helix is substantially coincident with that of the cylinder;

(b) coating the replica with a thin layer of removable material and then forming at least a portion of the ceramic mold means around the coated replica, leaving the other end of the cylinder opposite the helical strand exposed;

(c) removing the embedded replica from the formed mold means to provide the growth cavity and crystal selector passage therein, removal being effected by first removing the thin layer of removable material to provide a clearance space between the replica and mold means and then rotating the exposed end of the cylinder to unscrew the helical strand from the mold means in the same manner that a threaded member is removed from a threaded hole, the replica thereafter being available for reuse in making additional mold means.

4,111,253

FOUNDRY PROCESSES AND COMPOSITIONS

David Epstein, and John Bugg, both of London, England, assignors to The White Sea & Baltic Company Limited, London, England

Continuation-in-part of Ser. No. 282,633, Aug. 21, 1972, abandoned. This application Jan. 24, 1977, Ser. No. 761,756
Int. Cl.[2] B22C *1/22*
U.S. Cl. 164—43 **9 Claims**

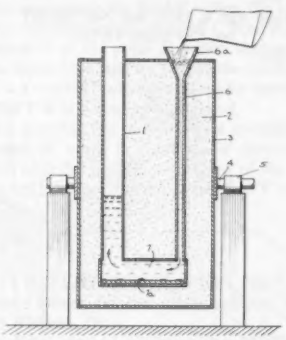
1. A method of making a foundry mold or core comprising forming a fluid mixture comprising foundry sand and a foamed aqueous phase comprising resin condensate, said resin condensate being an oligomeric form of formaldehyde with one or more of furfuryl alcohol phenol and urea, surfactant foaming agent, acidic curing agent and a silane, said silane having the general formula $R'Si(OR)_3$ in which R' is a C_2-C_6 alkylene group bonded to an amino, epoxy, mercapto, hydroxy, hydroxy-C_1-C_6 alkylamino, amino-C_1-C_6 alkylamino, C_2-C_6 alkenyl or C_2-C_6 alkenyl-carboxy group and the groups R may be the same or different and are selected from C_1-C_6 alkyl and C_1-C_6 alkoxy-substituted-C_1-C_6 alkyl, pouring the composition while fluid into a mould or core box which is immobile, and allowing the fluid composition to set without vibration of the mould or core box or ramming of the fluid mixture or other consolidation techniques, in which process the amount of silane is from 0.05 to 0.5% by weight based on the weight of silane and resin condensate, and the total amount of water in the mixture is less than 2% by weight of the mixture but is more than the minimum necessary to cause foaming of the aqueous phase to render the mixture fluid and in which the foamed aqueous phase retains its foamed structure until setting starts.

4,111,254

METAL CASTING METHOD

John Helge Haglund, Danbury, Conn., assignor to The Kanthal Corporation, Bethel, Conn.

Filed Aug. 3, 1976, Ser. No. 711,320
Int. Cl.[2] B22D *3/00*
U.S. Cl. 164—138 **5 Claims**

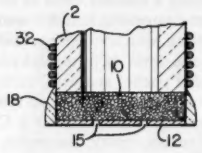


1. A method for casting molten metal to form ingots, comprising substantially vertically positioning in a container a plurality of sheet metal pipes with their bottoms interconnected by a runner and with the pipes in horizontally interspaced relation so as to form spaces therebetween, said container forming a space surrounding all of the pipes and said runner, filling all of said spaces solely with refractory particles so that said pipes and runner are embedded therein, covering the tops of said pipes and said container, bottom-pouring molten metal via said runner into said pipes so as to substantially fill said pipes and runner, inverting said containers while said metal remains molten, and allowing said metal to solidify while said container remains inverted.

4,111,255
FORMATION OF METAL PARTS

Theodore H. Krueger, Jr., Concord; Robert Eller, Boston; John O'Brien, Winchester, and William L. Robbins, Newton, all of Mass., assignors to Seal Incorporated, Naugatuck, Conn.

Continuation of Ser. No. 588,283, Jun. 19, 1975, abandoned.
This application Mar. 21, 1977, Ser. No. 779,494
Int. Cl.[2] B22D *27/16*
U.S. Cl. 164—255 3 Claims

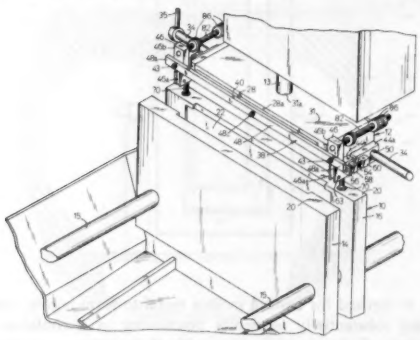


1. Apparatus for forming and casting a selected metal or alloy in a predetermined geometric pattern comprising a hollow non-porous support in the form of a tubular member which is made of a ceramic material not wettable by said selected metal or alloy, a porous ceramic disk attached to one end of said tubular member so as to form a wall of said hollow support, said ceramic disk being stiff and non-frangible and having pores with sizes in the range of from about 40A to about 50 microns, a non-porous ceramic coating covering only selected portions of said porous disk, said porous ceramic disk and said ceramic coating being non-wettable by said metal or alloy and coacting to form at least one groove arranged in accordance with at least part of said predetermined pattern, and means for coupling the interior space of said hollow support to evacuating means, said coupling means and said disk being at opposite ends of said tubular member.

4,111,256
LADLE GATE

Paul Edward Bantz, Waukesha, and Robert William Mayer, Milwaukee, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Apr. 4, 1977, Ser. No. 784,253
Int. Cl.[2] B22D *41/00*
U.S. Cl. 164—335 5 Claims



1. A ladle gate for use with casting apparatus and for preventing formation of drippage during casting, the casting apparatus including a mold and a ladle for holding molten metal, the ladle being shiftable between a first position wherein molten metal is poured into said mold and a second position wherein molten metal can be contained in said ladle, said ladle having a front wall including at least one pouring spout therein, the ladle gate comprising:

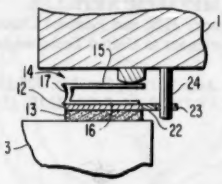
a bar supported adjacent said front wall and moveable with respect to said spouts between a first ladle gate position to flow preventing position wherein said bar is positioned against said front wall and covers at least a portion of said spout when said ladle shifts from said first position to said second position; and

means for supporting said bar against said front wall for movement between said first ladle gate position and said flow preventing position, said means for supporting the bar including a pair of spaced apart vertical arms supporting the bar therebetween, said vertical arms each having opposite ends and being pivotable about a horizontal axis extending through the lower of said ends, and the other of said opposite ends being moveable toward and away from said ladle, and means for biasing said bar against said front wall.

4,111,257
SEAL FOR ROTATING HEAT EXCHANGER

Klaus Wiegard, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 21, 1975, Ser. No. 551,857
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1974, 2408819
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—9 32 Claims



1. A sealing system for a rotating heat-exchanger which includes a turbine housing, the sealing system comprising a sealing strip means including base plate means and an elastic intermediate means, the sealing strip means being pressed against the rotating heat-exchanger by the elastic intermediate means, characterized in that the elastic intermediate means includes a diaphragm leaf spring means matched approximately to the shape of the sealing strip means and having two leg portions, a free end of one of the two leg portions of the diaphragm leaf spring means being fixedly connected at the base plate means of the sealing strip means, and a free end of the other of the two leg portions of the diaphragm leaf spring means freely elastically abutting a curved abutment surface of the housing.

4,111,258
SPLIT AIR CONVECTION PILE

Hans O. Jahns; Joseph W. Galate, and John A. Wheeler, Jr., all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

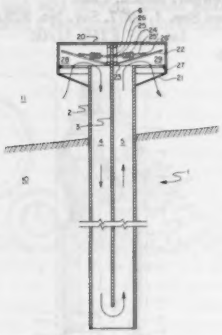
Filed May 10, 1976, Ser. No. 684,828
Int. Cl.[2] F28D *7/12;* F28C *3/00;* F28F *13/08*
U.S. Cl. 165—40 13 Claims

1. An air convection pile for transferring heat by natural convection to the ambient air from a hotter medium, comprising:

a. a pipe having an upper end and a lower end, said pipe having a length sufficient to extend from a surface which is exposed to the ambient air to a location within said hotter medium said lower end being disposed within said hotter medium and said upper end being disposed above said surface, said upper end being openable to the ambient air; and

b. a flow dividing partition disposed longitudinally within said pipe, having two longitudinal edges contacting the

inner wall of said pipe to divide the interior volume of said pipe into at least two flow channels, said flow dividing partition being adapted to substantially prevent the flow



of air between said flow channels at said upper end of said pipe and along a substantial portion of the length of said pipe and being adapted to permit the flow of air between said flow channels near said lower end of said pipe.

4,111,259

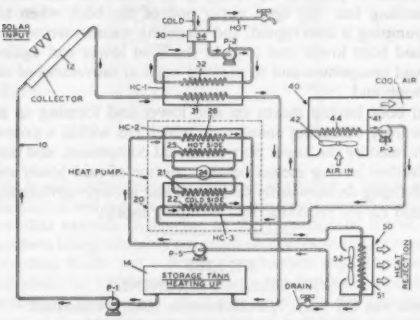
ENERGY CONSERVATION SYSTEM

John Lawrence Lebduska, New City, N.Y., assignor to Ecosol, Ltd., New York, N.Y.

Filed Mar. 12, 1976, Ser. No. 666,346

Int. Cl.² F24D *3/02*

U.S. Cl. 237—1 A **16 Claims**



1. A system for temperature conditioning room air and domestic hot water comprising a liquid circulation loop including solar collector means to transfer solar energy to the liquid, means to exchange heat between the liquid and room air, means to store the liquid, means to circulate the liquid through the loop, and means to exchange heat with a domestic hot water supply comprising a heat exchanger having a first coil in said liquid circulation loop and a second coil in heat exchange relationship with said first coil, said second coil being in a domestic hot water circulation loop which also includes domestic hot water storage means and means to circulate domestic hot water through the loop.

4,111,260

METHOD OF HEAT ACCUMULATION AND A THERMAL ACCUMULATOR FOR THE APPLICATION OF SAID METHOD

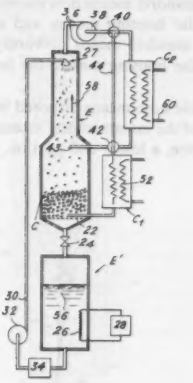
Alain Bricard, Grenoble; Maurice de Cachard, La Tronche, both of France; Pierre Goffinet, Brussels, Belgium; Gerard Kurka, Meylan, and Robert Moracchioli, Seyssinet, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 21, 1975, Ser. No. 551,828

Claims priority, application France, Mar. 1, 1974, 74 07079; May 31, 1974, 74 19072

Int. Cl.² F28D *21/00*

U.S. Cl. 165—104 S **4 Claims**



1. A thermal accumulator wherein a heat transporting fluid F is passed in direct contact over a material C having a high latent heat of fusion comprising:

a closed vessel E containing the material C and the fluid F, in a divided form, said vessel having a top and a bottom,

means for heating or cooling the fluid F by means of external sources,

means for circulating the fluid F within the vessel E,

means for withdrawing the material C from the lower end of the vessel E at the point at which said material is in a molten liquid state, and for storing the molten liquid material C in a vessel E' when the means for heating or cooling the fluid F is in a heating phase, and,

means for spraying the molten liquid material C, stored in the vessel E' when in the form of droplets into direct contact with the fluid F, at the top of the vessel E, the means for heating or cooling the fluid F is in a cooling phase.

4,111,261

WELLHEAD ISOLATION TOOL

Owen Norman Oliver, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 14, 1977, Ser. No. 777,379

Int. Cl.² E21B *33/03, 43/04, 43/118*

U.S. Cl. 166—86 **8 Claims**

1. In an apparatus for providing fluid communication between the interior of the upper end portion of an oil well production string and a source of high pressure fluid at the surface while isolating the fluid control equipment in the wellhead from high pressure fluids supplied through the apparatus from the source of high pressure fluid, the apparatus being of the type which includes:

elongated tubular housing means for connection in fluid communication with the interior of the wellhead and defining an inner bore therethrough; elongated tubular inner mandrel means, having upper and lower end portions and a longitudinal passage communicating between

the upper and lower end portions, concentrically positioned within said elongated tubular housing means in movable fluid sealing engagement therewith with the lower end portion of the inner mandrel means being adapted to extend below said elongated tubular housing means; means for communicating the source of high pressure fluid to the longitudinal passage at the upper end portion of the inner mandrel means; annular seal means carried by said inner mandrel means for providing sealing engagement between said inner mandrel means and the interior of the upper end portion of the oil well production string; and means for moving said inner mandrel means within said elongated tubular housing means to extend said inner mandrel means downwardly through said elongated tubular housing means, and alternately, to extend said inner mandrel means upwardly through said elongated tubular housing means, the improvement comprising:

tubular guide nose means disposed beneath the lower end portion of the inner mandrel means and having an upper end portion, a lower end portion, and a medial portion

extending between the upper and lower end portions, the inner diameter of the upper end portion of said tubular guide nose means defining a cross-sectional area substantially equal to the cross-sectional area of the longitudinal passage of the inner mandrel means, the inner diameter of the lower end portion of said tubular guide nose means being substantially equal to the diameter of the interior of the upper end portion of the oil well production string, and the medial portion of said tubular guide nose means defining a frusto-conically shaped inner surface diverging from the axis thereof at an angle of substantially 2 degrees mutually communicating and registering with and extending downwardly from the inner diameter of the upper end portion to communicate and register with the inner diameter of the lower end portion; and

means for connecting said tubular guide nose means to the lower end portion of the inner mandrel means with the inner diameter of the upper end portion of said tubular guide nose means coaxially communicating with the longitudinal passage of the inner mandrel means.

4,111,262

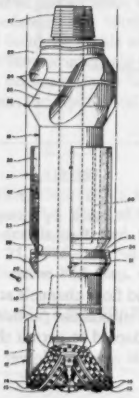
JUNK BOOT

Grant Duncan, Edmonton, Canada, assignor to Smith International, Inc., Newport Beach, Calif.

Filed Sep. 1, 1977, Ser. No. 829,603

Int. Cl.[2] E21B *31/08*

U.S. Cl. 166—99 **4 Claims**



3. A drilling assembly comprising:

a tubular drill string component including upper and lower portions having means formed thereon for connection to other drill string components, and an intermediate portion having a diameter larger than said lower portion;

an alongated tubular boot mounted on said component lower portion with the lower end of the boot being formed to engage said lower portion, the outer diameter of said boot being less than the outer diameter of said component so that drilling fluid can flow upwardly between the boot and the surrounding drill bore, said boot having an interior cylindrical wall above said lower portion spaced from said component and open at its upper end to define a spacer for collecting debris in drilling fluid which is pumped upwardly past the boot, said debris settling into the open upper end of the boot when the pumping is interrupted, and clamping means surrounding said boot lower end to hold the boot lower end against said component and to prevent vertical movement of the boot; and

said boot having means on said lower end forming an inwardly extending annular rib which fits within a groove formed by the lower portion of said component, said boot further having means on the exterior of said lower end defining an outwardly facing annular groove surrounding said rib for receiving said clamping means.

4,111,263

SOIL TILLING MACHINES

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Oct. 6, 1976, Ser. No. 730,282

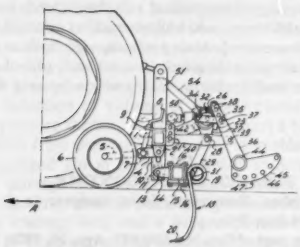
Claims priority, application Netherlands, Oct. 8, 1975, 7511788

Int. Cl.[2] A01B *27/00*

U.S. Cl. 172—54 **13 Claims**

1. A soil tilling machine having a frame movable over the ground and soil working means supported by said frame, said soil working means comprising a forward row of tine means and an elongated soil tilling member positioned to the rear of said tine means, said row extending transverse to the direction of travel, said tilling member being pivoted to said frame and comprising a support having elongate elements that extend substantially horizontal and transverse to the direction of travel, said elements being spaced apart one behind the other

with respect to the direction of machine travel, said tine means comprising a plurality of movable tines mounted on an elongated common frame portion that extends generally parallel to said tilling member, driving means connected to move said tines in the soil and said driving means linked to rock said tilling member about a substantially horizontal pivot axis during operation, said driving means comprising at least one eccentric that orbits about a substantially horizontal axis and arm means interconnecting the eccentric to said tilling member, said support together with the elements being pivoted upwardly and downwardly to contact, crumble and level the soil worked by said tine means.



4,111,264

SOIL CULTIVATING IMPLEMENTS

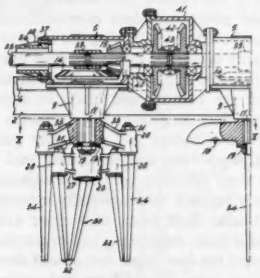
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Aug. 23, 1976, Ser. No. 717,004

Claims priority, application Netherlands, Aug. 25, 1975, 7509995

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—59 **7 Claims**



1. A soil cultivating implement comprising a frame and a plurality of soil working members supported on said frame in a row that extends transverse to the direction of travel, said members being rotatably mounted on corresponding upwardly extending shafts and a driving mechanism engaging each of said shafts to rotate same during operation, said mechanism including a rotary input shaft that extends in the direction of travel of the implement and has a gear in driving engagement with two separate, substantially horizontally extending driving shafts, said driving shafts comprising pinion gear means in driving engagement with said input gear within a gear box, said driving shafts being substantially co-axial and extending transverse to the direction of travel at opposite sides of said gear box, the upwardly extending shafts of said soil working members being drivingly connected to said driving shafts within respective transmission boxes, an upper part of each transmission box comprising a housing for corresponding co-operating gear means that establishes drive from one of the driving shafts to the respective upwardly extending shaft, a lower part of that box forming a bearing housing for a rotatable support for said upwardly extending shaft, lower parts of neighboring transmission boxes being spaced apart from one another by connecting members that house segments of the driving shafts and said transmission boxes being rigidly secured to said connecting members.

4,111,265

SOIL CULTIVATING MACHINES

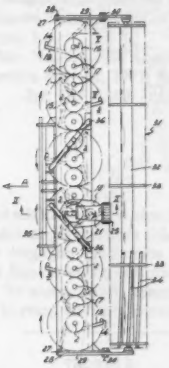
Ary van der Lely, Maasland, Netherlands, assignor to C. van der Lely NV, Maasland, Netherlands

Filed Sep. 20, 1976, Ser. No. 724,627

Claims priority, application Netherlands, Sep. 26, 1975, 7511330

Int. Cl.[2] A01B *33/14*

U.S. Cl. 172—59 **7 Claims**



1. A soil cultivating machine comprising a frame and a plurality of tined soil working members mounted on corresponding upwardly extending shafts, said shafts being supported on an elongated portion of said frame and extending in a row transverse to the direction of machine travel, said members being rotated about axes defined by said shafts and driving means connected to rotate said members, each member having downwardly extending tines with soil working portions laterally spaced from a corresponding shaft, the shafts of neighboring soil working members being drivenly engaged by meshed pinion gears and the tines of neighboring members being positioned to work overlapping and/or adjoining paths, shafts that define their axes of rotation and said respective shafts being located in said row, the tines of said member comprising at least three tines and each tine having a corresponding support portion, an inner part of said support portion being curved inwardly to at least partly surround the respective shaft of said soil working member, the inner parts of the tines being secured in connections adjacent the corresponding shaft and the remainder of said tines being deflectable with respect to said connections.

4,111,266

AGRICULTURAL IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Sep. 8, 1976, Ser. No. 721,566

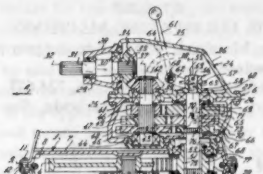
Claims priority, application Netherlands, Sep. 8, 1975, 7510538

Int. Cl.[2] A01B *33/06, 33/08*

U.S. Cl. 172—59 **20 Claims**

1. An agricultural implement comprising a frame and at least one tool being rotatably mounted on said frame, driving means connected to rotate said tool, including a change speed gear assembly, said assembly comprising two sets of different sized gears and the gears of one set being mounted on a driving shaft and engaging the gears of a second set, said second set of gears being mounted on a driven shaft, means connected to displace

one of the shafts relative to its respective gear set and selectively establish any one of a plurality of different transmission gear ratios in the drive to said tool, at least one displaceable shaft being externally splined and the splines of that shaft extending substantially axially parallel to the longitudinal axis



of that shaft and along only a portion of the length thereof, said gears on said displaceable shaft having matching internal spline portions that can be selectively engaged with the external splines of said one shaft, the gears of said second set having different axial thicknesses, those gears of smaller thickness having smaller pitch circles than the gears of greater thickness.

4,111,267

ROTARY HARROWS

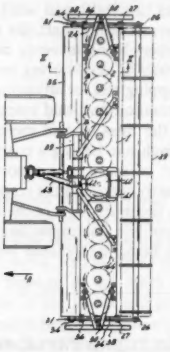
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Division of Ser. No. 553,693, Feb. 27, 1975, Pat. No. 4,018,288. This application Jan. 17, 1977, Ser. No. 759,668

Claims priority, application Netherlands, Mar. 1, 1974, 7402788

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—59 **4 Claims**



1. A rotary harrow comprising a frame and coupling means on said frame for attachment to a prime mover, a plurlaity of soil working members rotatably mounted on shafts journalled on said frame and driving means connected to rotate said soil working members, said shafts and soil working members extending in a row transverse to the normal direction of travel of the harrow, said soil working members each comprising a support rotatable on a generally vertical shaft and at least one tine that has a lower soil working portion depending downwardly from said support to contact the ground, screening means mounted on said cultivator and said screening means having an inclined surface that extends across the working width of said row immediately adjacent and in front of said supports, said inclined surface facing said soil working member supports and at least the lower portion of the inclined surface extending downwardly away from a plane that passes through the vertical shafts that define the axes of rotation of said row of soil working members, said screening means comprising a hollow member which can be fixed in operative position and said member having a longitudinal axis that extends transverse to the direction of travel, said hollow member connected to the frame with releaseable fastening means, said hollow member being turnable about its longitudinal axis to any one of a plurality of positions and fixable in that position by said fastening means.

4,111,268

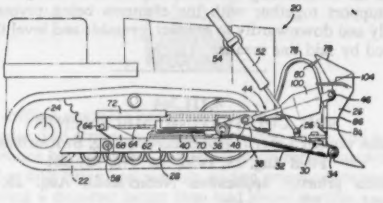
SCRAPER BLADE CONTROL

Claude M. Frisbee, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 680,817, Apr. 28, 1976, Pat. No. 4,074,769. This application Jun. 13, 1977, Ser. No. 806,246

Int. Cl.[2] E02F *3/76*

U.S. Cl. 172—805 **8 Claims**



1. A blade control for a vehicle having a transverse blade supported on the forward end of said vehicle for movement of the blade relative to the vehicle, said control including a plurality of hydraulic piston-cylinders interconnected between said vehicle and said blade for adjusting the relative position of said blade, a plurality of flexible hydraulic fluid lines extending from the lower forward end of said vehicle in an upwardly extending arch to the rear of said blade in a downwardly extending arch, said lines then extending across the rear of said blade to said piston-cylinders and a flexible guard-support means protecting, supporting and separating said lines, comprising a flexible sheet operably connected adjacent its lower end to said vehicle beneath said upwardly extending arch of said flexible hydraulic fluid lines, said sheet extending upwardly beneath said lines, supporting and protecting said arch and a clamp adjacent the free upper end of said sheet including a clamp on opposed sides of said lines and retainers located between said lines interconnecting said clamps, said retainers separating said lines and preventing tangling during operation of said blade.

4,111,269

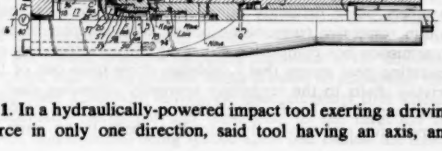
HYDRAULICALLY-POWERED IMPACT TOOL

Jack B. Ottestad, 1442 Muirlands Dr., La Jolla, Calif. 92037

Filed Oct. 8, 1975, Ser. No. 620,877

Int. Cl.[2] B25D *9/14*

U.S. Cl. 173—134 **34 Claims**



1. In a hydraulically-powered impact tool exerting a driving force in only one direction, said tool having an axis, and

wherein an axially movable piston makes a fluid-sealing, sliding fit between a variable volume closed gas chamber and a storage chamber, the gas chamber being adapted to receive and contain a compressible charge of gas under pressure, and in which a driving member including a piston head and a piston rod makes a fluid-sealing, sliding fit between said storage chamber and a loading chamber with a driving face facing into said storage chamber and a loading face facing into said loading chamber, the loading chamber being provided with an inlet port to receive hydraulic fluid under pressure, the impact tool being loaded by fluid forced into said loading chamber to move the driving member toward the storage chamber, and thereby causing reduction of volume of the gas chamber and an increased pressure therein, and caused to exert a blow by release of said fluid from the loading chamber to enable the energy of the compressed gas in the gas chamber to drive the driving member through fluid in the storage chamber, the improvement comprising: an orifice extending between the said driving face and loading face, and a poppet carried by the driving member to close said orifice to separate said loading chamber and storage chamber from one another while the impact tool is being loaded, and movable to open said orifice to permit flow of fluid through the orifice from the loading chamber to the storage chamber while the piston head moves toward the loading chamber under force derived from the gas chamber.

4,111,270

DRILLING ASSEMBLY

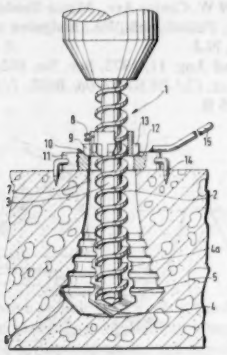
Artur Fischer, Weinhalde 34, D-7244 Tumlingen, Waldachtal 3, Fed. Rep. of Germany, and Klaus Fischer, Tumlingen, Waldachtal, Fed. Rep. of Germany, assignors to Artur Fischer, Tumlingen, Waldachtal, Fed. Rep. of Germany

Filed Aug. 31, 1976, Ser. No. 719,146

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1975, 2539521; Oct. 4, 1975, 2544468; Oct. 23, 1975, 2547412; Nov. 3, 1975, 2549057

Int. Cl.[2] E21B *17/10*

U.S. Cl. 175—220 **18 Claims**



1. In a drilling tool assembly for forming undercut holes in support structures, a combination comprising an elongated tool element rotatable about an axis of rotation and having a leading end, a trailing end, and cutting edges at least on said leading end; and means for supporting said tool element on a surface of a support structure to be formed with an undercut hole for pivoting relative thereto, including a collar connected to said tool element intermediate said ends thereof and having a convex surface facing towards the surface of the support structure, and an abutment member surrounding said tool element and having a first surface facing towards and abutting the surface of the support structure around an open end of the hole during the undercutting operation and a second surface axially spaced from said first surface and facing towards said collar, said second surface of said abutment member being concave and contacting said convex surface of said collar so that said concave and convex surfaces slide over one another during said pivoting of said tool element, said abutment member being plate-like and said concave and convex surfaces together forming a pivot with a cup-shaped concavo-convex contact surface so that low frictional resistance is offered to said pivoting of said tool element and said pivot is located closely adjacent to the surface of the support structure, said abutment member including a body and a tubular centering projection extending beyond said first abutting surface and receivable in the open end of the hole in the support structure.

4,111,271

HYDRAULIC JARRING DEVICE

Lee E. Perkins, Houma, La., assignor to Kajan Specialty Company, Inc., Houma, La.

Continuation of Ser. No. 605,057, Aug. 15, 1975, abandoned. This application May 31, 1977, Ser. No. 802,047

Int. Cl.[2] E21B *1/10*

U.S. Cl. 175—297 **29 Claims**

1. A hydraulic jarring device for dislodging an object lodged in a well, the device operating by means of a high pressure chamber and, an exhaust chamber and comprising:

an elongated, generally hollow barrel;

an elongated mandrel coaxially mounted with said barrel and adapted to move relative thereto in an axial direction under tension to generate pressure in the high pressure chamber;

anvil means mounted on one of said barrel or said mandrel;

hammer means mounted on the other of said barrel or said mandrel, axially aligned with said anvil means and adapted to impact thereagainst in response to abrupt venting of the high pressure chamber to the exhaust chamber;

impact control means for selectively isolating said high pressure chamber from said exhaust chamber for preventing impact between said hammer means and said anvil means;

a collapsible chamber pressurized with hydraulic fluid independently of the high pressure chamber for controlling the operation of said impact control means;

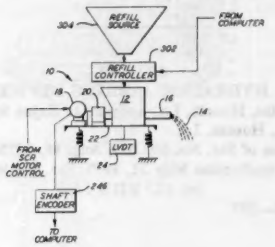
release means for abruptly releasing the hydraulic fluid from said collapsible chamber after a predetermined contraction thereof to effect said abrupt venting of said high pressure chamber resulting in said hammer means impacting against said anvil means; and

metering valve means connected to said collapsible chamber for controlling the rate at which the hydraulic fluid is released from the collapsible chamber up to said predetermined collapse.

4,111,272
WEIGH FEEDING APPARATUS

Ronald J. Ricciardi, Garfield; Angelo Ferrara, Fairfield; Joseph L. Hartmann, West Caldwell, and Gary R. Lauterbach, Livingston, all of N.J., assignors to Acrison, Incorporated, Moonachie, N.J., a part interest

Filed Dec. 7, 1976, Ser. No. 748,397
Int. Cl.[2] G01G *19/52, 13/04;* **B67D** *5/16*
U.S. Cl. 177—50 **21 Claims**

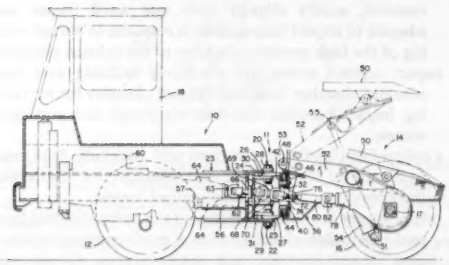


1. A weight feeding apparatus comprising:
a container for prefilling with a substance;
means for discharging said substance from said container at a controllable rate;
means for weighing said substance being discharged;
means coupled to said weighing means for producing first electrical signals proportional in amplitude to the weight determined by said weighing means;
voltage to frequency converter means connected to receive said first electrical signals;
digital computer means;
means coupled to an output of said voltage to frequency converter means for inputting data signals to said digital computer means;
said digital computer means being adapted to compute a corrective signal based on the input data signals received; and
means coupled between said computer means and said means for discharging said substance from said container for controlling the rate of discharge responsive to said corrective signal.

4,111,273
TERMINAL TRACTOR

Keith Blackburn, Enumclaw, and Douglas Ross, Bellevue, both of Wash., assignors to Dock Truck, Inc., Bellevue, Wash.

Filed Oct. 4, 1976, Ser. No. 729,836
Int. Cl.[2] B62D *15/00*
U.S. Cl. 180—14 R **10 Claims**

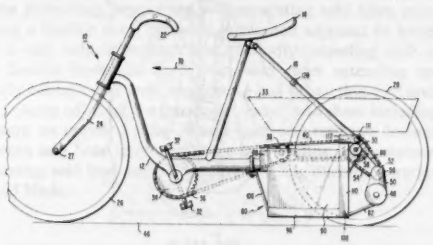


1. A tractor for use with a trailer having a fifth wheel component comprising:
front and rear chassis sections having front and rear axles, respectively, and pivotally connected at an articulation joint for steering the tractor by articulation of said chassis sections relative to one another at an articulation axis, there being front and rear wheels at the ends of the front and rear axles, respectively,
engine means on the front chassis section,
drive means connecting the engine means to one of said axles,
a forwardly facing driver's station located on the front chassis section in forwardly spaced relation from said articulation joint,
steering means for controlling said articulation;
fifth wheel means on said rear chassis section for detachably receiving the fifth wheel component of the trailer at a coupling location in the fifth wheel means and permitting turning of the trailer with little longitudinal movement thereof responsive to articulation of the tractor, and
lift means on the rear chassis section supporting the fifth wheel means in laterally centered relation and against lateral movement or horizontal swinging movement relative to the rear chassis section during articulation of said chassis sections and supporting the fifth wheel means for movement in a travel path between a lowered position whereat said coupling location is above and adjacent the level of the top extremity of the rear wheels and a raised position, said travel path being located such that said coupling location remains within the confines of laterally extending vertical planes passing through the front and rear extremities of the rear wheels as the fifth wheel means moves between said lowered and raised positions,
said tractor having a continuous horizontally unobstructed zone overlying the entire rear chassis section, lift means and articulation joint, and overlying a rear portion of the front chassis section behind the driver's station for the entire width of the front chassis section for receiving the forward portion of a trailer coupled to the tractor.

4,111,274
ELECTRICALLY-POWERED TRICYCLE

M. Dale King, 69 W. Center Ave., Maple Shade, N.J. 08052, and Kerry Binder, Philadelphia, Pa., assignors to M. Dale King, Maple Shade, N.J.

Filed Aug. 11, 1975, Ser. No. 603,758
Int. Cl.[2] B62D *61/06;* **B60L** *7/10*
U.S. Cl. 180—25 R **8 Claims**



1. An electric-powered cycle for carrying an operator comprising
a steerable wheel;
an electric motor drive for a wheel of said cycle;
battery means including a plurality of batteries for energizing said motor; and
a circuit including
(a) manually-operated speed switch means for selectively connecting said batteries in parallel and series circuits for energization of the motor to provide respectively for low and high speeds and for supplying current from said battery means to said motor to drive said wheel.
(b) one electronic unidirectional circuit means for blocking current generated by the motor when the back EMF exceeds the voltage of said battery means in the

low speed condition whereby free coasting of the cycle above said low speed is permitted in the absence of regenerative braking action;

(c) manually-operated regenerative-braking switch means operable concurrently with said speed switch means for bypassing said one unidirectional circuit means concurrently with said batteries being connected in parallel circuits for low speed to enable regenerative braking action, and including another unidirectional means for conducting only when the back EMF exceeds the voltage of said battery circuit connected in parallel so that the regenerative braking action, enabled by said regenerative-braking switch means, is effective only at speeds above said low speed whereby the operator can selectively choose to maintain the cycle at the low speed established by said parallel battery circuit by concurrent operation of both said regenerative switch means and said speed switch means in the low speed condition; and

(d) said speed switch means includes means for bypassing said one unidirectional circuit means when the batteries are connected in series whereby regenerative braking is automatically provided under high-speed energization.

4,111,275

COMPACT CAB-OVER EQUIPPED WITH A COOLER CONDENSER

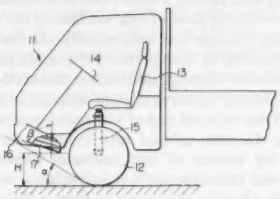
Joji Masuda, Yokohama, and Makoto Moriya, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 15, 1976, Ser. No. 750,621

Claims priority, application Japan, Dec. 15, 1975, 50/169187[U]

Int. Cl.² B60K *11/04*

U.S. Cl. 180—68 R **2 Claims**



1. In an automotive vehicle with a cab at the front, a radiator for an engine for propelling the vehicle mounted within an engine compartment disposed under and separated from said cab by a cab floor;

a condenser for a refrigeration device mounted within the engine compartment at an area disposed forward from said radiator with respect to the longitudinal direction of the vehicle and slanted from a perpendicular plane transverse to the longitudinal direction of the vehicle by a predetermined angle, said condenser having an electric fan and a shroud means for securing a sufficient amount of air passing therethrough;

said condenser being disposed laterally of the radiator and on an opposite side of the engine compartment to a side over which a steering wheel of the vehicle is disposed;

said condenser being arranged and slanted so that when in operation of the vehicle a sufficient amount of ambient atmosphere required by said radiator will flow toward said radiator without passing through said condenser.

4,111,276

SKIRTS FOR GAS CUSHION VEHICLES

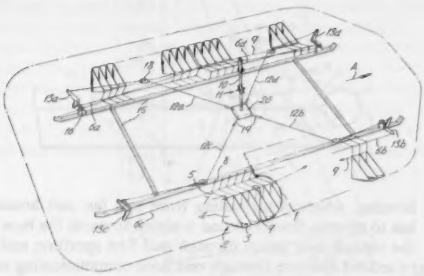
John Edward Rapson, Southampton, and Dean Alders, Lyndhurst, both of England, assignors to Hovercraft Development Limited, London, England

Filed Mar. 22, 1977, Ser. No. 780,104

Claims priority, application United Kingdom, Mar. 26, 1976, 12257/76

Int. Cl.² B60V *1/00*

U.S. Cl. 180—117 **8 Claims**



1. In a gas cushion vehicle having a skirt comprising upper and lower parts of flexible sheet material, the upper part being connected to the vehicle body so as to be deflectable relative thereto, at least the lower part comprising a contiguous succession of independently deflectable flexible wall members each having an outer portion which faces the gas cushion and a pair of inwardly extending side portions, the side portions being connected to the vehicle body by tie means, the provision of a skirt control mechanism comprising adjusting tie means extending substantially at right angles to the said tie means and operatively connected to substantially the midpoint thereof, means including a lever system operative to effect linear movement of the adjusting tie means and means to at least restrict movement of the wall members in a direction parallel to the adjusting tie means upon adjusting movement thereof, whereby upon linear movement of the adjusting tie means the said tie means connected to the side portions of the wall members are caused to be angled and thereby result in the outer portions of the wall members being moved in a direction towards or away from the vehicle body, the lever system being mechanically equivalent to the lever system effectively constituted by the said tie means and the said adjusting tie means and arranged to act such that as the mechanical advantage of one lever system alters an equal and opposite alteration occurs in the other lever system so that for a given cushion pressure the force required to operate the adjusting tie means is maintained substantially constant at least over a predetermined range of movement.

4,111,277

GAS CUSHION VEHICLE

Michel Francois Peissel, Calle del Puig, Cadaques (Gerona), Spain, and Robert Longley Trillo, Broadlands, Brockenhurst, Hampshire, England

Continuation of Ser. No. 579,175, May 20, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,510

Claims priority, application United Kingdom, May 20, 1974, 22426/74

Int. Cl.² B60V *1/06*

U.S. Cl. 180—122 **6 Claims**

1. In an air cushion vehicle comprising

(a) a deck;

(b) a downwardly depending skirt about said deck defining a first plenum chamber, said skirt containing a second inflatable annular chamber; and

(c) a fan unit housing containing a fan the axis of rotation of which is horizontal and having an air intake and an air exit

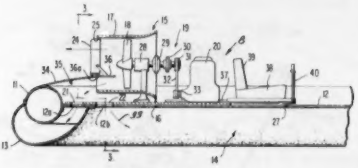
end, said fan unit housing being mounted at the stern of the vehicle;

the improvement comprising:

(d) a third chamber located about said deck;

(e) means communicating said air exit end of said fan unit housing to said third chamber for pressurizing the same;

(f) a first aperture through said deck communicating said third chamber to said first chamber, said first aperture being located forward of said air exit end of said fan unit



housing, whereby air exiting from said fan unit housing has to reverse directions and is aimed towards the bow of the vehicle as it passes through said first aperture; and

(g) a second aperture through said deck communicating said third chamber to said second chamber, said second aperture being located rearward of said air exit end of said fan unit housing, whereby air exiting from said housing does not have to reverse directions in order to enter said second chamber.

4,111,278

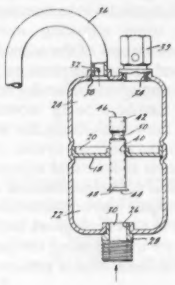
DISCHARGE MUFFLER

Ernest R. Bergman, Rossburg, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Feb. 9, 1977, Ser. No. 767,162

Int. Cl.[2] F01N *1/00*

U.S. Cl. 181—249 **17 Claims**



1. A discharge muffler for a gas compressor comprising:

a casing having a hollow interior;

a partition in said casing dividing said hollow interior into first and second chambers of substantially equal volume and dimensions;

a relatively straight restrictor tube extending through said partition, said restriction tube being of a length approximating the length of one of said chambers in the direction of gas flow therethrough and having

open ends with a central passageway extending therethrough,

a flared entrance to said passageway at one said open end, and

an annular restriction in said passageway between said open ends, said restriction being spaced from the opposite open end a distance sufficient to permit a significant recovery in the pressure drop caused by said restriction at design operating conditions;

an inlet passage communicating with said first chamber; and

an outlet passage communicating with said second chamber.

4,111,279

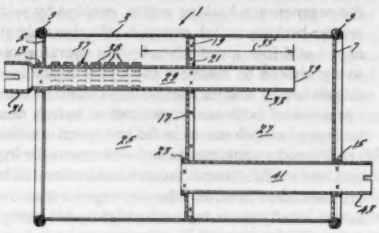
LOUVER FLOW MUFFLER

Dale E. Sterrett, Grass Lake, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed Jul. 26, 1976, Ser. No. 708,513

Int. Cl.[2] F01N *1/00*

U.S. Cl. 181—264 **9 Claims**



1. In a muffler for reducing the noise level of combustion engine exhaust gases and for attenuating a preselected low frequency sound, the combination of a housing having port means forming an inlet and port means forming an outlet for gas flowing through the muffler, substantially imperforate partition means forming a resonator chamber in the housing, said housing having a gas flow space outside said resonator chamber, a single gas flow tube member with a wall and open at both ends and having one end portion connected to a port means and the other end portion extending into and opening into said resonator chamber and supported on said partition means. said gas flow tube member having an intermediate portion between said end portions and located outside of said chamber and said intermediate portion being in the path of gas flowing between the inlet and the outlet and said intermediate portion including a gas flow through section in said space containing a multiplicity of small area sound attenuating perforations in said wall having a total open area substantially equal to the cross sectional area of that section of the tube member and providing passage for substantially all the gas flowing through the muffler to flow between the inside and the outside of the tube member through said wall at said section, the length of the tube member between the end thereof in said resonator chamber and the adjacent end of said perforated section as well as the inside diameter of said tube member throughout said length and the volume of said resonator chamber all being interrelated and interdependent in accordance with the Helmholtz formula whereby they serve to form a Helmholtz system to attenuate said preselected low frequency, and a gas flow conduit open at both ends and supported on said partition means and extending through said resonator chamber and having one end portion connected to the other of said port means and the other end portion opening into said gas flow space whereby gas may flow between it and said perforations.

4,111,280

SUPPORTING GUIDE RAIL FOR LADDER SAFETY DEVICE

Donald R. Devine, La Habra, and William L. Gardiner, Anaheim, both of Calif., assignors to Norton Company, Worcester, Mass.

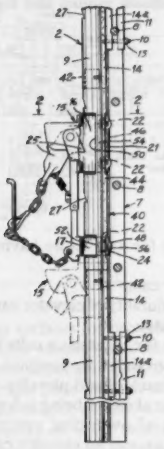
Filed Jan. 31, 1977, Ser. No. 763,979

Int. Cl.[2] E06C *7/18*; A62B *1/16*

U.S. Cl. 182—8 **7 Claims**

1. A continuous supporting guide rail for a ladder climbing safety device of the type securable to the ladder comprising a clamping sleeve assembly movable axially along the supporting guide rail including at least one tubular bearing part having

a wall extending circumferentially around beyond the diameter of an engaging circular portion of the supporting guide rail to opposite sides of a guide strip receiving channel of predetermined width in the wall whereby the sleeve is held and prevented against rotation by a guide strip on the supporting guide rail, a locking pawl pivotally connected to the bearing part for locking engagement with the supporting guide rail, means for connecting the locking pawl and sleeve to a safety belt of a person ascending or descending the ladder whereby the sleeve assembly is normally moved along the supporting guide rail by the person but which immediately forces the locking pawl into



locking engagement with the supporting guide rail in the event the person falls from the ladder wherein the improvement comprises:

notched means situated on and between opposite ends of the continuous supporting guide rail for allowing the sleeve assembly to be selectively displaced radially into and out of guiding engagement with the guide strip, rotated into and out of alignment with the guide strip and displaced laterally by the notched means for connecting and disconnecting the sleeve assembly to and from the supporting guide rail in a predetermined relatively safe manner.

4,111,281

BUILDING FRONT ROPE LIFT

Max Jacobs, #179, Wittkullerstrasse, Solingen-Wald, Fed. Rep. of Germany

Filed Jun. 27, 1977, Ser. No. 810,454

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1976, 2628041

Int. Cl.[2] B61B 7/04

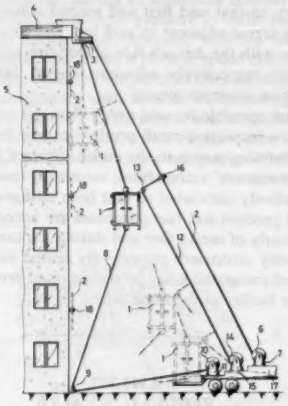
U.S. Cl. 182—10 **5 Claims**

1. A building front rope lift for rescuing persons in particular subject to fire hazards in tall buildings, comprising

(a) a lift cage suspended from one end of at least one load rope led around at least one guide roller secured to a tall building, said load rope extending from said guide roller downwardly inclined to a winch drum to which its other end is connected;

(b) a first roller secured to the lift cage, and

(c) a traction rope led around the first roller and carrying at one end a second roller arranged to roll on the load rope, said traction rope being diverted by the first roller into the



direction of the downwardly inclined load rope and connected by its other end to a further winch drum.

4,111,282

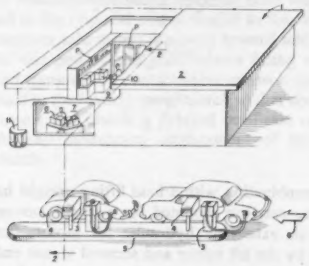
SINGLE-STOP SHOPPING FACILITY AND METHOD

Michael Mark Vayda, Jr., 1600 S. Joyce St., Suite B1610, Arlington, Va. 22202

Filed Aug. 23, 1976, Ser. No. 716,374

Int. Cl.[2] E04H 3/04

U.S. Cl. 186—1 C **5 Claims**



1. A drive-in, single-stop shopping facility for vending retail products and fuel to customers respectively seated in first and second automobiles, the facility comprising:

(a) means for warehousing the retail products and personnel for the facility;

(b) first and second dispensing means operable by a ramp attendant for respectively delivering fuel to said first and second automobiles;

(c) first and second purchase selection means operable by said customers respectively seated in said first and second automobiles, each of said purchase selection means including means for informing the customer of the selection of fuel and retail products for sale at the facility, means for communicating the customer's fuel purchase selection to said ramp attendant, and means for communicating the customer's retail product selections to a cashier and order clerk within said warehousing means;

(d) first and second payment means operable by said customers respectively seated in said first and second automobiles and said cashier who is located at a control location within said warehousing means, each of said payment means

including means for the customer to pay for the total cost of the customer's retail product and fuel order;

(e) means for directing the automobile traffic pattern to the facility so that said first and second automobiles respectively arrive adjacent to said first and second dispensing means with the driver's side of said first and second automobiles respectively adjacent to said first and second purchase selection means;

(f) means operable by said order clerk for passing the customer's respective retail product orders from within the warehousing means to the outside thereof for delivery to the customers' automobiles; means (a) through (f) being operatively associated so that both customer's respective retail product and fuel purchases are accomplished independently of each other and during the same time frame, whereby customers respectively seated in said first and second automobiles can be served retail products and fuel at the facility at the same time.

4,111,283

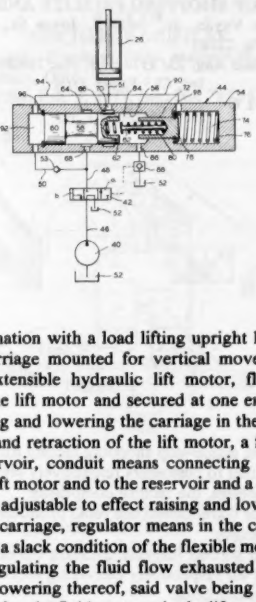
REGULATOR VALVE

Russell Hastings, Jr., Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 20, 1976, Ser. No. 752,365

Int. Cl.[2] B66B *9/20*; F15B *13/042*

U.S. Cl. 187—9 R **18 Claims**



1. In combination with a load lifting upright having a load supporting carriage mounted for vertical movement on the upright, an extensible hydraulic lift motor, flexible means operated by the lift motor and secured at one end to the carriage for raising and lowering the carriage in the upright during extension and retraction of the lift motor, a fluid pressure supply, a reservoir, conduit means connecting said pressure supply to the lift motor and to the reservoir and a control in the conduit means adjustable to effect raising and lowering of said lift motor and carriage, regulator means in the conduit means for preventing a slack condition of the flexible means comprising a valve regulating the fluid flow exhausted from the lift motor during lowering thereof, said valve being responsive at one side thereof to the fluid pressure in the lift motor and at the opposite side thereof simultaneously to the forces of a first spring means and of the combined force of a second spring means and a lift motor fluid pressure responsive means during movement of the valve to regulate the fluid flow exhausted from the lift motor, the force of said second spring means being effective on said valve subsequent to the force of said first spring means, said fluid flow exhaust being regulated by said valve inversely as a function of fluid pressure in the lift motor, movement of the valve to a closed position being effected by said first spring means when the fluid pressure in the lift motor decreases to a predetermined low pressure whereby to prevent fluid exhaust from the lift motor.

4,111,284

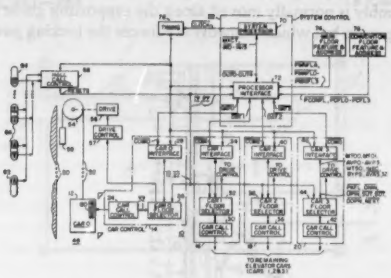
ELEVATOR SYSTEM

Charles L. Winkler, Worthington, and Kenneth M. Eichler, McKeesport, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 503,212, Sep. 4, 1974, abandoned. This application May 5, 1975, Ser. No. 574,664

Int. Cl.[2] B66B *1/18*

U.S. Cl. 187—29 R **10 Claims**



1. An elevator system for a structure having a plurality of landings, comprising:

a plurality of elevator cars,

means mounting said plurality of elevator cars for movement relative to the landings,

call registering means for registering calls for elevator service from at least certain of the landings,

car control means for each of said plurality of elevator cars, each of said car control means being independently operable, in the absence of overriding synchronized control signals, to move its associated elevator car in response to calls for elevator service,

system control means responsive to said call registering means for preparing data words according to a predetermined call answering strategy, said data words having a predetermined format,

interface means connected between each of said car control means and said system control means,

said system control means intermittently providing one of said data words for each of said interface means,

each of said interface means including means keyed by the predetermined format of the data word for storing the data word received from said system control means, and means for repetitively and serially reading out the stored data word to its associated car control means, to provide the overriding synchronized control signals required by the car control means to place the elevator cars under control of the system control means.

4,111,285

SLIDABLE CALIPER AND PIVOTAL MOUNTING MEANS THEREFOR

Hermann Hans Hönick, Immendorf, Fed. Rep. of Germany, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 455,747, Mar. 28, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,818

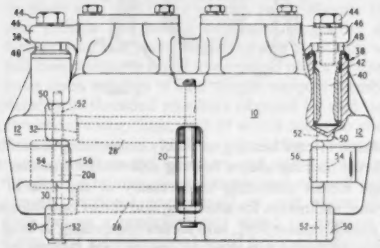
Claims priority, application United Kingdom, Apr. 5, 1973, 16264/73

Int. Cl.[2] F16D *65/02*

U.S. Cl. 188—73.6 **13 Claims**

1. In a sliding caliper disc brake of the type comprising a torque plate member adapted for fixing to a vehicle frame or like portion, a unitary caliper assembly, means moveably mounting said caliper assembly on the torque plate member, said caliper assembly carrying spot-type friction pads adapted for movement into engagement with opposed faces of a rotatable disc, said caliper assembly being constructed that the pads cannot be removed or replaced with the caliper assembly in its normal operative position relative to the disc, said mounting

means comprising a first releasable connection between the unitary caliper assembly and the torque plate member, said first connection comprising two sets of sliding surfaces disposed one set on each circumferential side of the caliper assembly, said two sets of sliding surfaces being constructed and arranged to permit movement of the caliper assembly relative to the torque plate member only in the direction of the axis of disc rotation and also being arranged that said caliper assembly cannot be moved to a position relative to the torque plate member in which the pads may be removed from the caliper assembly without complete release of said two sets of sliding surfaces the improvement comprising means on said torque plate member and said caliper assembly independent of said



two sets of sliding surfaces for providing a second connection between said caliper assembly and said torque plate member which enables said caliper assembly to be moved to a position relative to said torque plate member which permits removal of the pads from the caliper assembly, said second connection comprising an opening on one of said torque plate member and said unitary caliper assembly, and a pivot pin extending between said caliper assembly and said torque plate member and cooperating with said opening to pivotally support said unitary caliper assembly on said torque plate member in a location which enables the former to be pivoted relative to the latter to a position permitting removal or replacement of said pads following complete release of said two sets of sliding surfaces.

4,111,286

Patent Not Issued For This Number

4,111,287

SHIFT MODULATING CONTROL ACCUMULATOR

Jerry Lee Daniels, Mossville, and Albert Lloyd Woody, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 28, 1977, Ser. No. 763,738

Int. Cl.[2] F16D *39/00*

U.S. Cl. 192—3.27 **7 Claims**

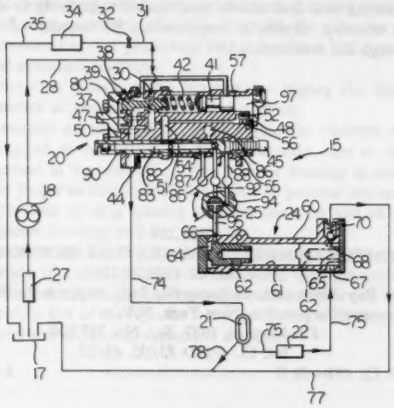
1. A hydraulic transmission control circuit for a loader for selectively actuating a hydraulically-operated clutch comprising:

a source of fluid under pressure;

a fluid reservoir;

transmission control valve means communicating with the source of fluid and having an adjustable element for selectively directing fluid under pressure to outlet passages for delivery to hydraulically-operated clutches including a forward speed clutch and a reverse speed clutch;

a hydraullically-operated torque converter having an intake port communicating with another outlet passage of said transmission control valve means and a discharge port, said transmission control valve means controlling fluid flow to said torque converter during speed changes; and



an accumulator with a hydraulically-charged, free-sliding piston and having a port at one end communicating with the intake of the reverse speed clutch and a port at the opposite end communicating with the fluid reservoir so that fluid at the opposite end is vented to the fluid reservoir whenever said piston is moved toward said opposite end, said one end of said accumulator filling with fluid when said transmission control valve means is operated to direct fluid to the reverse speed clutch so that operation of the reverse speed clutch is delayed until said one end is filled thereby modulating engagement of the reverse speed clutch.

4,111,288

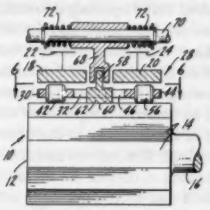
GEAR CHANGING MECHANISM

Mark John Fogelberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 30, 1976, Ser. No. 755,698

Int. Cl.[2] F16D *41/08, 47/00*

U.S. Cl. 192—38 **11 Claims**



1. In a torque transfer mechanism, the combination comprising first means including first and second races, second means including a third race, first and second bi-directional clutches

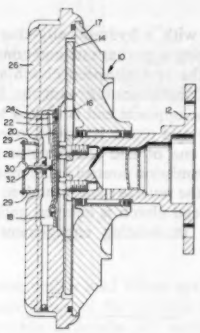
between said first and second races, respectively, and said third race, and shifting means engageable with said first clutch for positioning said first clutch in a freewheeling mode and rendering said second clutch positionable selectively in driving and coasting modes in response to the transfer of torque through the mechanism, said shifting means being engageable with said first and second clutches for rendering one of said clutches positionable selectively in freewheeling and coasting modes and the other of said clutches positionable selectively in driving and freewheeling modes in response to a torque reversal, said shifting means being engageable with said second clutch for positioning said second clutch in a freewheeling mode and rendering said first clutch positionable selectively in driving and coasting modes in response to the transfer of torque through the mechanism.

4,111,289

DIMPLED BIMETAL TEMPERATURE RESPONSIVE FAN DRIVE COUPLING

Earl Ray Brummett, Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Filed Apr. 6, 1977, Ser. No. 785,038
Int. Cl.[2] F16D *35/00, 43/25*
U.S. Cl. 192—58 B **2 Claims**



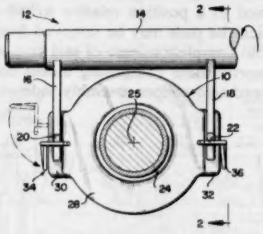
1. A temperature controlled fluid coupling adapted to couple a radiator cooling fan of an internal combustion engine to the engine to thereby rotate the fan, the fluid coupling being of the type including a housing having a drive chamber into which a rotor extends and is positioned, a shear liquid reservoir chamber in the housing, the reservoir chamber communicating with the drive chamber through a temperature controlled valve, the amount of valve opening determining the degree of fluid coupling between the engine and the fan, the valve in one position establishing maximum rotary coupling, a bi-metal laminate mounted on the housing and actuating the valve by an elongated rod, bowing of the bi-metal laminate in one direction due to changes in its ambient temperature causing the valve to open and bowing of the laminate in the opposite manner causing the valve to close, the improvement comprising, the bi-metal laminate having a dimple to thereby define a convex zone on one surface and a concave zone on its other surface, the said elongated rod normally engaging one of said zones in a predetermined orientation of the bi-metal laminate relative to the valve, whereby mounting of the bi-metal laminate in an other orientation relative to the valve causes the valve to be fully open at all temperatures.

4,111,290

THRUST BEARING WITH SPRING CLIP MOUNTING

Richard A. Carlstedt, Chicago, Ill., assignor to Aetna Bearing Company, Chicago, Ill.

Filed Apr. 14, 1977, Ser. No. 787,566
Int. Cl.[2] F16D *23/00*
U.S. Cl. 192—98 **17 Claims**



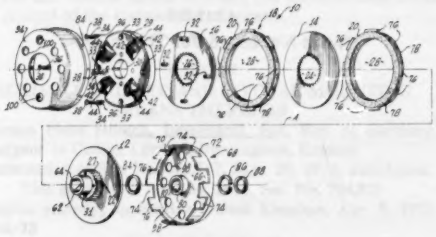
1. A clutch release bearing assembly comprising in combination: a thrust bearing unit, a bearing unit carrier member having flange means extending transversely of the axis of said bearing unit, and means for attaching said thrust bearing assembly to a clutch release fork, said means comprising at least one spring clip pivotally attached to one of said flanges of said carrier member for pivotal movement substantially perpendicular to the axis through said bearing unit, said spring clip comprising, a connector portion for attaching said clip to said carrier, a traverse portion for engaging said clutch release fork, and a tensioning portion formed intermediate said connector portion and said transverse portion, such that said clip may be pivoted away from said bearing unit axis to permit said clutch release fork to be moved into position in overlying engagement with said bearing assembly, and said clip then pivoted toward said axis to engage said transverse portion over said clutch release fork with said clip and the force provided by said tensioning portion effecting interconnection of said bearing assembly and said clutch release fork.

4,111,291

CENTRIFUGAL FRICTION MECHANISM

Gilbert F. Horstman, Arcadia, Calif., assignor to Horstman Manufacturing Co., Inc., Monrovia, Calif.

Filed Jun. 15, 1977, Ser. No. 806,764
Int. Cl.[2] F16D *43/06*
U.S. Cl. 192—105 C **16 Claims**



1. A centrifugal friction clutch comprising:
a plurality of concentric clutch plates;
a plurality of clutch disks interleaved between said plates, said disks being concentric with said plates;
a hub extending axially through said plates and disks connecting said plates for joint rotation;
a generally cylindrical drum surrounding said plates and disks and concentric therewith, said drum interlocking the

peripheral edges of said disks, whereby said disks and said drum are interconnected for joint rotation;

a weight support member concentric with said plates and disks having a plurality of apertures therein;

a plurality of threaded stems projecting axially from one of said plates through said apertures in said weight support member, whereby said weight support member is connected to said plates for rotation therewith;

means for causing said plates to frictionally engage said disks comprising a symmetrical array of weights, each pivotably mounted on said weight support member about a pivot axis substantially perpendicular to the rotational axis of said weight support member, each of said weights having a drive portion disposed radially inwardly from its pivot axis and a cam portion extending radially outwardly from its pivot axis, said drive portion being heavier than said cam portion and having its center of gravity disposed further from said plates than from said pivot axis, whereby said cam portion is urged toward said plates by centrifugal force upon rotation of said weight support member;

a plurality of threaded members engaged by said stems;

a plurality of coil springs, each of which encircles one of said threaded members, said springs being compressed between said threaded members and said support member, thereby restraining pivotal movement of said weights to prevent frictional engagement of said plates with said disks below a predetermined speed of rotation of said plates, said predetermined speed being adjustable by turning said threaded member;

input connector means for supplying rotational power to said plates; and

output connector means for supplying rotational power from said disks.

4,111,292

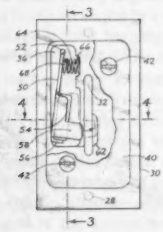
COIN MACHINE SLUG REJECTOR

Eugene H. Dixon, 16022 SE. River Rd., Milwaukee, Wis. 97222

Continuation of Ser. No. 534,631, Dec. 19, 1974, abandoned. This application Feb. 24, 1977, Ser. No. 771,655

Int. Cl.[2] G07F *3/02*

U.S. Cl. 194—101 **6 Claims**



1. A rejector of magnetic coins and other magnetic slugs for a coin-operated machine, comprising:

a. a housing having a coin slot therethrough,

b. a slug rejector finger in the housing movable between a normal position retracted from said coin slot and an extended position intercepting said coin slot,

c. a magnet mounted slidably in a bore in the housing and engaging said rejector finger at one end and arranged to be influenced by a magnetic coin or slug inserted in the coin slot to move the finger to said extended position, and

d. magnetic abutment means in the housing disposed adjacent the end of the magnet opposite the finger for normally urging the finger to said normally retracted position.

6. A rejector of magnetic coins and other magnetic slugs for a coin-operated machine having a coin insert slot through its outer surface, the rejector comprising:

a. a housing having opposed front and back surfaces, a coin slot extending through said front and back surfaces, and a chamber in the housing separated from the coin slot by an internal wall,

b. a slug rejector finger member confined within the periphery of the housing and movable between a normal position retracted from said coin slot and an extended position intercepting said coin slot, the slug rejector finger member comprising a lever pivoted at one end within the chamber on a pivot axis disposed parallel to the longitudinal direction of the coin slot and hence parallel to the direction of coin movement through the coin slot, the lever having a finger projecting from the opposite end of the lever and terminating inwardly of the back surface of the housing and registering with a transverse opening in said internal wall communicating the coin slot with the chamber for movement of the projecting finger between said normal and extended positions,

c. retraction means in the housing for urging the finger member to said normal retracted position,

d. a magnet mounted on the lever within the chamber and arranged to be influenced by a magnetic coin or slug inserted in the coin slot of the rejector housing to move said finger to said extended position to prevent the magnetic coin or slug passing through the coin slot of the rejector housing, and

e. means on the housing for attaching the latter to the outer surface of a coin-operated machine with the back surface of the housing facing the coin-operated machine and with the coin slot of the rejector housing aligned with the coin insert slot of the coin-operated machine.

4,111,293

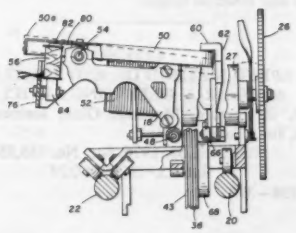
RIBBON TRANSPORTING AND SHIFTING MECHANISM

Barry C. Kockler, Lewisville, Tex., and Ronald L. Beaty, Moses Lake, Wash., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1977, Ser. No. 758,380

Int. Cl.[2] B41J *33/58*

U.S. Cl. 400—208 **8 Claims**



1. A ribbon transporting and shifting mechanism for a typewriter having a print head and ribbon carrier positionable along a line of printing by a drive motor, and a ribbon cartridge assembly pivotally mounted on the carrier, comprising:

a cam mounted on the head and ribbon carrier and actuated by the drive motor,

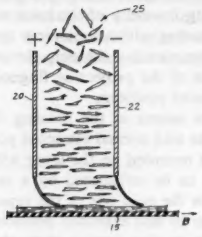
a cam follower mounted on the head and ribbon carrier and including an upstop, said cam follower driven by said cam to oscillate the position of the upstop with reference to the head and ribbon carrier, and

cartridge lift means coupled to the cartridge assembly for positioning thereof against the upstop of said cam follower, said lift means includes a solenoid attached to said carrier and a spring fastened to the cartridge assembly and held in contact with said solenoid when energized to resiliently bias the cartridge assembly against the upstop.

4,111,294
ALIGNMENT PLATE CONSTRUCTION FOR ELECTROSTATIC PARTICLE ORIENTATION

C. Thomas Carpenter, and Norman W. Stunkard, both of Lake Oswego, Oreg., assignors to Voltage Systems, Inc., Lake Oswego, Oreg.

Continuation-in-part of Ser. No. 674,974, Apr. 8, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 790,007
Int. Cl.² B65G *47/24*
U.S. Cl. 198—381 **17 Claims**



1. Apparatus adapted for mounting above a conveyor and for unidirectionally aligning elongate particles generally in the direction of conveyance in the forming of a mat of particleboard comprising

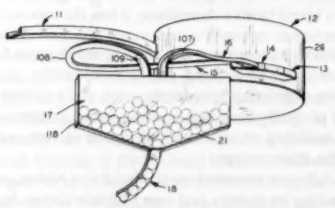
a plurality of substantially flat, spaced-apart plates of conductive material disposed substantially upright and parallel to one another and positioned generally transversely to the direction of conveyance, said plates adapted to be electrostatically charged to provide a potential difference between said plates so that the particles will experience electric field aligning forces generally parallel to the direction of conveyance as the particles pass between the plates;

each of said plates including flexible, resistive material secured thereto which extends below a bottom edge of the plate to a region adjacent the mat being formed on the conveyor so that electric field lines between adjacent plates are maintained substantially horizontally over the plate and material height.

4,111,295
HIGH SPEED METHOD OF AND APPARATUS FOR SIMILARLY ORIENTING ARTICLES

Arthur J. Rutherford, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 30, 1976, Ser. No. 755,553
Int. Cl.² B65G *47/24*
U.S. Cl. 198—399 **5 Claims**

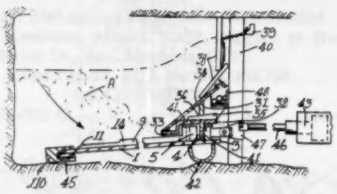


1. Apparatus for separating a first group of open-mouthed articles having a top plane portion, a skirt portion connected to the outer periphery of the top panel portion and an open mouth opposite said top panel portion, and having a first orientation from a second group of open-mouthed articles identical to the first group of open-mouthed articles but having a second orientation, inverting said second group of open-mouthed articles from said second orientation to said first orientation and recombining said second group of open-mouthed articles having said first orientation, said apparatus comprising, in combination, means for receiving said open-mouthed articles of said first and second orientations in serial alignment on a reference surface and for maintaining the orientation of said articles relative to said reference surface, first finger means adjacent to said reference surface and adapted to engage said first group of open-mouthed articles having a first orientation and to deflect said first group of open-mouthed articles along a first deflected path, a second finger means overlying said first finger means and said reference surface and adapted to engage said second group of open-mouthed articles having a second orientation and deflect said second group of open-mouthed articles along a second deflected path, means within said second deflected path to invert said second group of open-mouthed articles from said first orientation to said second orientation, means for moving said first and second groups of open-mouthed articles along said first and second deflected paths, and an accumulator means for receiving said first and second groups of open-mouthed articles from said first and second deflected paths to re-combine said first and second groups of open-mouthed articles, all of the re-combined open-mouthed articles having said first orientation.

4,111,296
ROCK CONVEYORS

Mark B. Glossop, 11 Westview Dr., Bryanston Ext. 5, Randburg; Adrian C. Buckmaster, 29 Clonmore Rd., Bryanston 7; Neville G. W. Cook, 118 Mattie Ave., Parkmore, Sandton; Justin P. M. Hojem, 52 Buffalo Rd., Emmarentia, Johannesburg; Noel C. Joughin, 14 Kerry Rd., Parkview, Johannesburg; Richard F. Taylor, Meadowvale, Plot 179, Tuohyvale, Dist. Krugersdorp; Robert W. Cramp, 3 Sable Rd., Verwoerd Park, Alberton, and John L. Hatcher, 153 Monterey, 27 Lily Ave., Berea, Johannesburg, all of South Africa

Continuation of Ser. No. 589,759, Jun. 24, 1975. This application Jul. 5, 1977, Ser. No. 812,651
Claims priority, application South Africa, Jun. 25, 1974, 74/4077; Mar. 20, 1975, 75/1750; Mar. 20, 1975, 75/1751
Int. Cl.² B65G *25/10*
U.S. Cl. 198—519 **19 Claims**



1. A conveyor for use in underground mining operations comprising a conveyor bed of flat plates carrying articular members joined together in an articulated manner in a plane parallel to said plates to allow limited universal relative movement between said plates, an articular member defined by a rigid projection extending from each plate adjacent a transverse edge of each plate near a longitudinal edge of the bed, the projections providing between them co-operating hook and socket formations adapted to constrain adjacent transverse edges of the plates, the bed having a longitudinal free edge thereof to rest on the ground, a track mounted on the bed adjacent the opposite longitudinal edge thereof which accomodates and constrains therein a reciprocable chain of rigid links of substantially uniform cross-section hinged together to provide a substantially continuous face in a side of the track which is open and facing the free edge of the bed, a seried of spaced flights hingedly attached directly to chain links between hinge points and arranged to extend across the bed, stops on each flight being provided to limit rotational movement of the

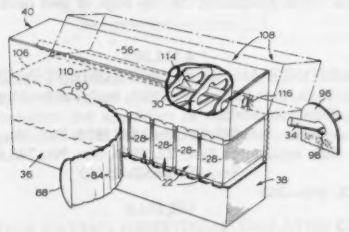
flights in both directions over the surface of the bed, means connected to the chain near each end for reciprocating the chain under tension along the track and means for advancing the conveyor in use transverse of its length with the free edge forward to self load by insertion of said edge under a pile of material to be conveyed extending along a substantial part of the length of the conveyor.

4,111,297

CARTRIDGE FOR HARDWARE PACKAGES

Arthur Paulin, 7 High Point Rd., Don Mills, Canada (M2B 2A3)

Filed Jul. 22, 1977, Ser. No. 817,933
Int. Cl.² B65D *23/12*
U.S. Cl. 206—44.12 **7 Claims**



1. A cartridge comprising:

a carton;

a plurality of similar packages of hardware and like articles disposed in said carton, each said package comprising a container having a hanging tab which is formed with an opening and by which the container can be suspended from a suspension element of a display rack in use;

the carton including front and rear walls, opposite end walls, and top and bottom walls which together define an enclosure, said packages being arranged in a row in said enclosure with the openings in their hanging tabs aligned with one another and with said end walls of the carton, said front wall of the carton being formed with upper and lower rows of perforations which extend from end to end of said front wall and which define a removable tear-strip, and each said end wall of the carton being perforated to allow an upper portion of the carton to be folded back about a line extending transversely of said back wall after removal of said tear-strip, thereby exposing the hanging tabs of the packages in the carton and permitting the packages to be loaded seriatim as a batch onto a suspension element of a display rack;

and an elongate member disposed in said carton and passing through the openings in the package hanging tabs, the member being in the form of a thin walled tube dimensioned to permit an end thereof to be engaged over an end of a display rack suspension element prior to loading of packages onto said element, so that the tubular member acts as a guide along which the packages can slide onto the suspension element;

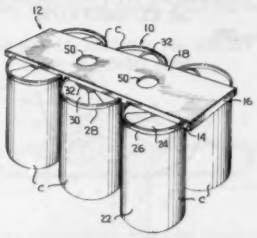
one of said end walls of the carton being formed with a star-shaped perforation aligned with said openings in the package hanging tabs and through which said tubular member can be inserted into the carton after loading of the packages during assembly of the cartridge, whereby the portions of the carton defining said star-shaped perforation tend to return to their original positions after insertion of the member, and prevent the member leaving the carton.

4,111,298

REUSABLE CAN CARRIER STRIP

Carmen T. Mascia, Clarendon Hills, and Gary K. Hasegawa, Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Aug. 16, 1977, Ser. No. 825,242
Int. Cl.² B65D *71/00, 85/62*
U.S. Cl. 206—151 **16 Claims**



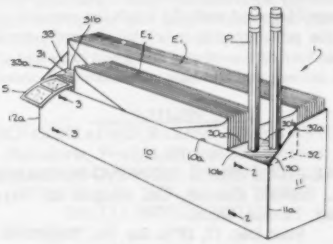
1. A new article of manufacture comprising a reusable can carrier, said can carrier being in the form of an elongated strip having formed on one surface thereof a series of can retaining means, each can retaining means being in the form of two concentrically arranged arcuate flange segments projecting from said surface of said strip, said two flanges being spaced apart a distance to define a socket of a size to have tightly received therein a cylindrical end portion of a can including the customary seam securing an end unit of the can to a body thereof, said strip having reinforcing flanges depending therefrom along sides thereof and each of said sockets opening through one of said sides at two spaced locations.

4,111,299

DEFORMABLE CONTAINER

David Taub, 1387 E. 46th St., New York, N.Y. 11234

Filed Nov. 15, 1976, Ser. No. 741,682
Int. Cl.² B65D *85/54*
U.S. Cl. 206—215 **13 Claims**



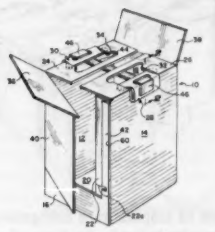
1. A generally rectangular container for holding articles of different dimension, said container having an elongated front wall, an elongated back wall and parallel sidewalls connected in tubular relation, and a container bottom panel;

a generally rectangular tab extending from and hingedly connected along one of its edges to one of said walls and having a pair of free edges;

support means hingedly connecting said tab to another of said walls adjacent to said one wall for supporting said tab for movement between a first position in which said tab is coplanar with said one wall and a second position in which said tab is located in the interior of said container in a plane which is parallel to said bottom panel, whereby when said tab is in said second position thereof said free edges thereof form in the interior of said container a longitudinal and a transverse abutment, respectively, for posi-

tioning in said container articles having different dimensions.

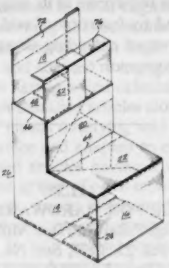
4,111,300
PAPERBOARD WARDROBE CONTAINER
James H. Partain, Norcross, Ga., assignor to Stone Container Corporation, Chicago, Ill.
Filed Jun. 17, 1977, Ser. No. 807,383
Int. Cl.[2] B65D *85/18*
U.S. Cl. 206—280 **16 Claims**



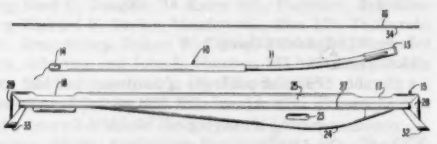
1. In a wardrobe container formed from a one-piece blank having at least two side walls, two end walls and a bottom wall connected together, and including a hanger bar having opposed end portions each defined by inside and outside legs, the inprovement comprising; a pair of top flaps each hingedly connected along a top free edge of one of said two side walls, each of said top flaps including hanger bar support means formed from said flaps, said support means being hingedly connected to said side wall and being of a length less than the length of said top flap and a width less than the width of said top flap and foldable separately from said top flap along multiple parallel lines of fold substantially parallel to said hinged connection with the side wall into a multiple panel folded assemblage engaged against the side wall, each of said multiple panel folded assemblages including a hole in the center portion of the most interior panel of said assemblage, one end portion of said hanger bar being received over each folded assemblage with the outside leg positioned against the outer surface of the folded assemblage and with the inside leg received within the hole in the most interior panel to prevent lateral shifting thereof; and a first one of said end walls including a hingedly mounted access panel allowing access into said container interior.

4,111,301
ONE-PIECE CHAIR SHIPPING CONTAINER
Austin L. English, Conyers, Ga., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Dec. 17, 1976, Ser. No. 751,503
Int. Cl.[2] B65D *85/00*
U.S. Cl. 206—326 **8 Claims**

1. A one-piece pre-cut shipping container comprising
an L-shaped body formed by front, back, top, bottom, vertical neck, shelf and two L-shaped side panels,
said side, back and front panels being interconnected along parallel spaced corner fold lines,
bottom flaps connected to each side, back and front panels forming said bottom of the container,
said top panel being connected to the back panel,
said shelf and neck panels being perpendicular to each other and connected to the front panel,
neck and shelf; neck and shelf flap means separately connected to the side panels in underlying relation to the top, neck and shelf panels to provide vertical strength to said neck panel and added strength to said shelf panel,
said neck and shelf flap means being triangular and connected to the side panel along perpendicular fold lines respectively, and underlying rectangular top closure portions connected to respective neck flaps along a top fold line running adjacent the top edge of said neck panel.



4,111,302
CARTONED MEDICAL INSTRUMENT PACKAGE
Nathan Roth, San Francisco, Calif., assignor to Alza Corporation, Palo Alto, Calif.
Division of Ser. No. 597,020, Jul. 18, 1975, Pat. No. 4,019,633. This application Nov. 22, 1976, Ser. No. 743,617
Int. Cl.[2] B65D *83/10*
U.S. Cl. 206—363 **8 Claims**

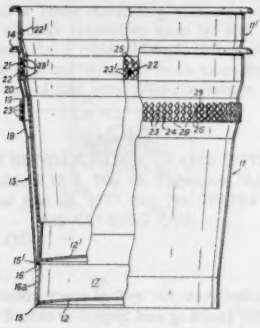


1. Medical instrument package comprising:
(a) a thermoplastic tray having a cavity for holding the instrument, at least a portion of the cavity being deeper than it is wide, and a convexly curved marginal ledge about said cavity extending outwardly from the opening of the cavity and defining the top surface of the tray;
(b) a cover for said cavity that has the same curvature as said marginal ledge; and
(c) means interposed between the cover and ledge for adhesively securing the cover to the ledge about the complete perimeter of the cavity such that the cover may be peeled away from said ledge to expose the cavity.

4,111,303
PLASTICS CONTAINERS
Peter Arnold Compton, King's Lynn, England, assignor to Mars Limited, London, England
Filed Jul. 29, 1976, Ser. No. 709,853
Claims priority, application United Kingdom, Aug. 1, 1975, 32345/75; Mar. 17, 1976, 10799/76
Int. Cl.[2] B65D *21/02, 85/72*
U.S. Cl. 206—520 **27 Claims**

1. A nestable container of resilient plastic material comprising:
a bottom wall;
a side wall, said side wall diverging generally from said bottom wall to the top of said wall;
at least one projection on one surface of said side wall;
at least one pair of circumferentially spaced mutually opposed shoulders with a spacing between them on the other surface of said side wall, said projection and said shoulders being so positioned that when such identical containers are nested to form a stack the projection of one container

cooperates with the shoulders of another container to hold the containers together in the stack, the width of the spacing between said shoulders being less than the width of said projection, said shoulders being resiliently yieldable so that when the containers are brought together the



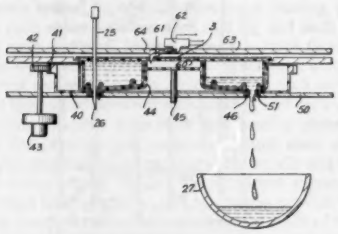
shoulders of the other container are displaced circumferentially to allow said projection of said one container to pass between the shoulders of the other container and engage behind them holding the containers together in the stack.

4,111,304

CARTRIDGE HAVING INDIVIDUAL ISOLATED CELLS

Bernard Lucas, Rouen, France, assignor to Padeg A.G., Moehlin, Switzerland

Continuation of Ser. No. 620,498, Oct. 7, 1975, Pat. No. 4,053,054. This application Jul. 25, 1977, Ser. No. 818,730
Int. Cl.² B65D *25/08*
U.S. Cl. 206—534 **9 Claims**



1. A cartridge adapted for containing a dispensible liquid comprising a one-piece body of material defining a plurality of cells secured to one another and constituting an integral assembly, the cells being arranged in a circular array around a common center and adapted for containing a liquid, each said cell having a bottom wall, side walls and an open face, and a sheet sealably closing said open face of the cell after introduction of the liquid thereto, a support for said body including index means thereon forming a program for controlling operation of an automatic control mechanism of a machine which can carry out various operations as a function of said program whereby the operation of said machine will be subordinated to said program, said array of cells being arranged around a central region, said support being in said central region, said sheet closing all of the cells, said material of said body and said sheet being made of pierceable material and being arranged with said sheet juxtaposed on said body and located in spaced relation above said bottom wall of said cell, a sealed chamber enclosed by a perforable sheath disposed in at least one of said cells, said sealed chamber occupying less than the full volume of said one cell to leave a compartment in said cell containing said liquid, a second liquid being contained in said sealed chamber, means for positioning said sealed chamber within the cell in a stable supported position therein such that a perforator can penetrate in sequence through the sheet, said sealed chamber and the bottom of the cell to cause the liquids from the sealed chamber and the cell to flow from the bottom of the cell.

4,111,305

PACKAGED DINNER SERVING TRAY

Claude E. Thomas, 7066 Stone Brook, West Bloomfield, Mich. 48010

Filed Sep. 21, 1977, Ser. No. 835,055
Int. Cl.² B65D *1/34*
U.S. Cl. 206—563 **5 Claims**

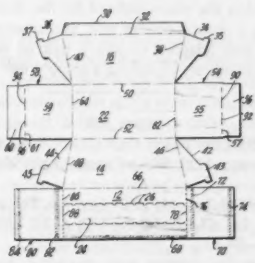
1. A serving tray for holding a packaged dinner tray with the packaged dinner tray having a predetermined shape and an outwardly extending peripheral flange, said serving tray being generally rectangular in shape and having a central cavity formed therein, said central cavity being a preselected shape similar to the predetermined shape of the dinner tray whereby the dinner tray can be received in said cavity, said cavity having a flat lower wall to support the bottom of said packaged dinner tray against buckling and puncture during use, said lower wall terminating in upwardly formed side walls to define said cavity side walls terminating in a planar upper surface surrounding said cavity, said planar upper surface being generally parallel to said lower wall and forming an upper support surface for said dinner tray peripheral flange, four outer side walls depending downwardly from said upper surface, said four outer side walls terminating in a transversely extending lower peripheral flange, support surfaces defined by said lower peripheral flange at the juncture of adjacent ones of said outer side walls said lower wall being spaced upwardly from said support surfaces such that when said serving tray is placed on a table said lower wall is out of contact from the table top to avoid condensation or other damage to said table top, and an elongated notch formed in each of at least two opposed of said side walls to provide the dual functions of (a) permitting gripping of said tray by the user thereof and (b) to permit air to circulate freely from outside of said tray to the underside of said flat lower wall to remove condensation thereform.

4,111,306

SELF-CONTAINED BAKING TRAY CARTON

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed May 18, 1977, Ser. No. 798,025
Int. Cl.² B65D *25/14, 5/22*
U.S. Cl. 206—611 **5 Claims**



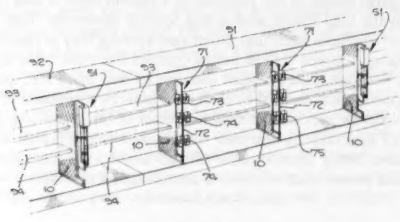
1. A self contained baking tray having expandable sidewalls comprising: a tubular container having a hingedly connected

bottom panel, top panel, opposed sidewalls and opposed end walls, said top panel having a perforated tear out portion extending along the longitudinal axis of the container, intermediate the longitudinal edges of said top panel, said top panel further including two pairs of perforations, one perforation of each pair extending from said tear out portion to an opposite longitudinal edge of said top panel; each of said end walls being of a multilayered construction including an inner panel hingedly connected to said bottom panel, a flap member hingedly connected to the top portion of said inner panel and outwardly folded thereover to form a sliding space intermediate said inner panel and said flap member, and an outer panel hingedly connected to said top panel and overlapping its respective flap member and inner panel, said inner panel further including a pair of spaced slots along the top portion thereof; each of said end walls further including a pair of locking flanges, each locking flange being hingedly connected to one of said sidewalls, each of said locking flanges being disposed in the sliding space intermediate its respective inner panel and flap member, each of said locking flanges including a locking tip aligned with one of the spaced slots of its respective inner panel, whereby after the tear out portion of the top panel is removed, each of said side panels may be pivoted outwardly with said locking flanges sliding in their respective sliding spaces until their respective locking tips contact the end of their respective slots thereby providing an enlarged baking tray container.

4,111,307
DISPLAY SUPPORTING MERCHANDISE SECTION DIVIDER

Albert L. Peggs, San Dimas, Calif., assignor to The Peggs Company Inc., Azusa, Calif.

Filed Jun. 3, 1977, Ser. No. 803,043
Int. Cl.[2] A47F *3/08, 5/02*
U.S. Cl. 211—1.5 **8 Claims**



1. A merchandise section divider for supporting one of a plurality of display units and comprising a divider frame, a divider panel within the frame, said panel and frame defining a divider of substantially flat, planar configuration, a display unit, a pair of static mounts on the frame extending within the plane defined by the divider for releasably attaching a static display unit to the frame, a pair of pivot mounts on the frame extending within the plane defined by the divider for releasably attaching a pivotal display unit, and attachment means on each display unit adapted to join a pair of said mounts for releasably alternatively attaching a display unit to the divider.

4,111,308
CASSETTE TAPE CARTRIDGE HOLDER

James L. Brown, 1227 West Cabrini Apt. 901, Chicago, Ill. 60607

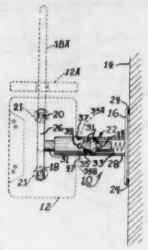
Filed Jan. 14, 1977, Ser. No. 745,266
Int. Cl.[2] B65D *85/672*; A47F *7/00*
U.S. Cl. 211—59.1 **8 Claims**

1. A holder for cassette tape cartridges having a pair of oppositely-disposed spaced-apart openings comprising:

a base;

a pair of spaced-apart fingers for receiving the pair of spaced-apart openings in the cassette tape cartridges to support them; and

connecting means attaching the rear end portions of said fingers to said base and spacing said rear end portions of said fingers apart by a distance substantially equal to the

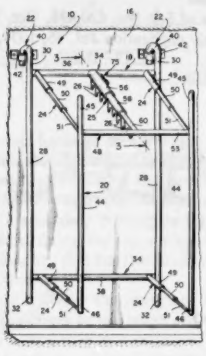


distance between the spaced-apart openings in the cartridges for enabling said fingers to extend forwardly from their said rear end portions toward one another convergingly in a common plane to provide spring tension between them when the cartridges are disposed thereon.

4,111,309
ADJUSTABLE GARMENT ASSEMBLY

Edgar Henry, 54-15 108th St., Corona, N.Y. 11368

Filed Apr. 26, 1977, Ser. No. 791,028
Int. Cl.[2] A47F *7/24*
U.S. Cl. 211—104 **32 Claims**



1. An adjustable garment assembly comprising in combination:

a. an inner frame,

b. mounting means for removably securing said inner frame to a door or the like,

c. an outer frame,

d. coupling means extending between said inner frame and said outer frame,

e. said coupling means comprising expandable sections connected at one end thereof to said inner frame and at the opposite end thereof to said outer frame so as to obtain adjusted positions of said outer frame relative to said inner frame,

f. supporting means extending between said inner frame and said outer frame and having a plurality of hooks extending downwardly therefrom for receiving hangers thereon,

g. said supporting means being longitudinally movable to different positions in conjunction with said coupling means,

h. said inner frame includes a pair of spaced apart vertically

extending inner frame members having upper and lower ends,

i. inner connecting means extending between said inner frame members for rigidly securing said inner frame members together,

j. said inner connecting means includes an upper extending element and a lower extending element, said elements connected at their respective ends to said inner frame members such that a rigid structure is formed, and

k. said mounting means includes a hook extending from each said upper end of said inner frame members.

4,111,310

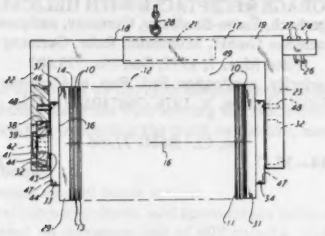
SIGNATURE BUNDLE HOIST CLAMP WITH PIVOT

Walter John Stobb, R.D. 1, Box 60, Pittstown, N.J. 08867

Filed Apr. 25, 1977, Ser. No. 790,314

Int. Cl.[2] B65G 7/00

U.S. Cl. 214—1 QD **5 Claims**



1. A signature bundle hoist clamp with pivot, comprising a bundle of signatures stacked in side-by-side arrangement and having signature folds and unfolded edges along opposite sides of the bundle, an end support on each opposite end of the bundle, a C-clamp extending along the bundle and having two legs disposed at respective opposite ends of the bundle and respectively spaced from said supports, a bearing plate disposed in each space between each said leg and each said support and each said plate having a planar surface faced toward the respective said support and in contact therewith, a combined thrust and axial bearing attached with each said bearing plate and interposed between each said leg and each said bearing plate for rotatable support of said bearing plates on said legs and for pressing said supports toward each other and thereby compressing the signatures in the bundle and with said bearings being axially aligned for rotational support of the bundle about its longitudinal axis to thereby provide for turning of the bundle to selectively position the folds of the signatures, interengaging self-releasing alignment means operatively associated with each of said legs and each of said bearing plates for releasably rotationally securing said bearing plates relative to said legs and thereby have said said signatures oriented with the folds and unfolded edges disposed to position the bundle with selectively either the folds or the unfolded edges.

4,111,311

MATERIAL HANDLING UNIT

Hideo Hirama, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

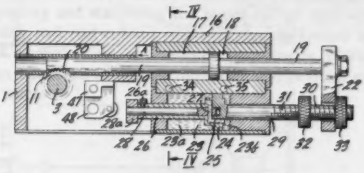
Filed Sep. 17, 1976, Ser. No. 724,313

Claims priority, application Japan, Sep. 17, 1975, 50-127771

Int. Cl.[2] B25J 9/00

U.S. Cl. 214—1 BC **4 Claims**

1. A material handling unit comprising a movable manipulator for gripping the material and moving it from one position to another, a driving cylinder and a piston reciprocable in said cylinder for driving said manipulator and having a piston rod extending from said cylinder, abutment means for setting the limits of movement of said manipulator, single dashpot means for applying a damping force to said manipulator to decelerate said manipulator before it reaches the limits of its movement, said dashpot means comprising a dashpot cylinder disposed parallel to said working cylinder and having cylinder heads at opposite ends thereof, hydraulic fluid filling said dashpot cylinder and sealed therein, a piston reciprocable in said dashpot cylinder, first and second piston rods of like diameter extending in opposite directions from said piston and through said cylinder heads respectively, spaced abutments adjustably fixed on said first piston rod outside said dashpot cylinder, a connecting member on said piston rod of said driving cylinder



engageable with said spaced abutments for adjusting the operating range of said dashpot means to determine the range of movement of said manipulator in which said damping force is applied, said piston of said dashpot cylinder having a passage extending from one side to the other side thereof, valve means in said passage for adjustably restricting said passage and means extending through said second piston rod for controlling said valve means to adjust the damping force applied to said manipulator by said dashpot means.

4,111,312

TRANSPORT VEHICLES

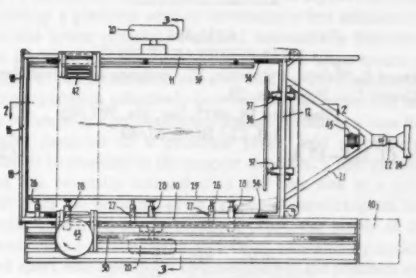
Leslie Henry Wilson, 28 Gould St., Frankston, Australia

Filed Jan. 25, 1977, Ser. No. 762,303

Claims priority, application Australia, Jan. 27, 1976, 4626/76

Int. Cl.[2] B65G 57/32

U.S. Cl. 214—6 B **5 Claims**



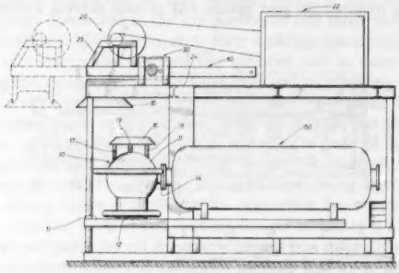
1. A transport vehicle of the kind having a body supported on transport wheels, a vertically movable floor, and raising and lowering means therefor, said body being open at the back and comprising spaced side walls and a front wall, and including a horizontally disposed barrier member arranged inwardly of and adjacent and parallel to, each of the side walls, thereby to define the respective sides of an interior space within which bales or other articles may be stacked on and over the floor to form a layer upon said floor, said barrier members being arranged within the upper part of the body so as to be movable inwardly and outwardly above the floor when the latter is in its uppermost operative position, and power actuated means operable to move at least one of said barrier members inwardly, thereby to push said bales or other articles closer together after formation of each layer.

4,111,313

DIVING BELL HANDLING SYSTEM AND METHOD

Max A. W. Reiher, Mandeville, and Richard C. Faust, New Orleans, both of La., assignors to J. Ray McDermott & Co., New Orleans, La.

Filed May 6, 1977, Ser. No. 794,583
Int. Cl.[2] B63B *35/40*
U.S. Cl. 214—15 R 16 Claims



7. A system for handling submarine vehicles comprising:

a frame mounted on a marine station for horizontal movement between a first stabilized extended position over the water and a second retracted position over a deck of the station;

a frusto-conical superstructure mounted on the submarine vehicle;

a cone member secured to said frame and having a downwardly opening frusto-conical inner surface having an angular pitch corresponding to the angular pitch of said superstructure;

means on said frame for directing a hoist cable into communication with the submarine vehicle for lifting the vehicle along a vertical path wherein said superstructure substantially aligns with said cone member inner surface;

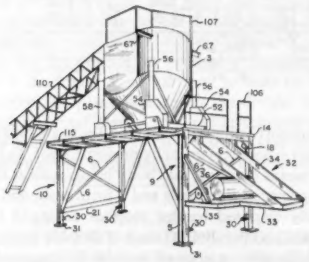
locking means for securing said superstructure to said member when they are fully engaged with the inner surface of said cone member lying in a close relation to the outer surface of said superstructure.

4,111,314

TRANSPORTABLE SILO

Richard L. Nelson, Princeton, Ill., assignor to Walnut Sand & Gravel Co., Princeton, Ill.

Filed May 18, 1977, Ser. No. 797,993
Int. Cl.[2] B65G *65/40*
U.S. Cl. 214—17 A 5 Claims



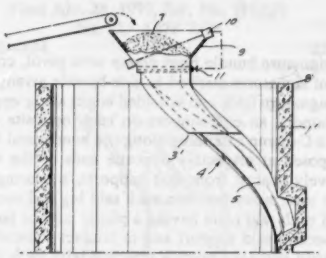
1. A transportable storage and dispensing silo assembly comprising a self-supporting structure including spaced supporting posts and a platform connected to and supported by said posts, said platform having laterally spaced side members and longitudinally spaced end members connecting said side members and defining an opening in said platform; bearing means mounted on and extending above said side memebers; trunions, journaled in said bearing means; a silo, mounted on said trunions for pivotal movement between an erected position wholly above said platform and a lowered, transport position at least partly within the said platform opening, means mounted on said structure for moving said silo between erected and lowered positions, and means for selectively mounting said structure on and demounting said structure from wheels whereby said structure can be transported.

4,111,315

BULK-STORAGE RECEPTACLE WITH HELICAL CHUTE

Paul Hungerbach, Essen-Bredeney, Germany, assignor to Thyssen Schachtbau GmbH, Mühlheim, Ruhr, Germany

Filed Mar. 7, 1977, Ser. No. 775,403
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 7607102[U]; Mar. 9, 1976, 7607103[U]; Mar. 10, 1976, 2609797
Int. Cl.[2] B65G *11/06*
U.S. Cl. 214—17 C 26 Claims



1. A bulk-storage receptacle comprising:

a structure formed with an upright wall defining a storage chamber for flowable bulk material;

means forming a helical chute opening toward said chamber and spiraling downwardly along said wall, said helical chute having a ramp receiving said material and extending generally transversely to said wall while being formed with a first tangential inclination and a first radial inclination;

a peripherally closed inlet chute disposed above said helical chute for feeding bulk material to said helical chute; and

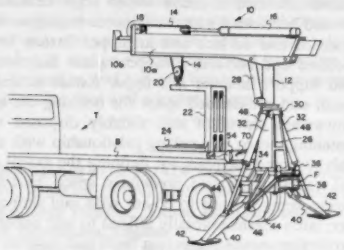
a transition region between said inlet chute and said helical chute provided with a ramp delivering said bulk material to said inlet chute, the ramp of said transition region having a tangential angle varying continuously from a second tangential inclination adjacent said inlet chute to said first tangential inclination at said helical chute; said ramp of said transition region merging into said ramp of said helical chute and having over the entire length of said transition region a slope greater than the critical friction angle for said material.

5. The bulk-storage receptacle defined in claim 1, further comprising a storage hopper on an upper end of said inlet chute, control means between said hopper and said inlet chute for metering said material into said inlet chute, and level-responsive means in said hopper for monitoring the level of material therein to operate said control means.

4,111,316
TRUCK MOUNTED HOIST

Joachim Harold Richard Wappler, 317 Kenollie Rd., Mississauga, Canada

Filed Apr. 11, 1977, Ser. No. 786,281
Claims priority, application Canada, Apr. 13, 1976, 250198
Int. Cl.[2] B60P 1/54
U.S. Cl. 214—75 H 3 Claims



1. Hoist apparatus of the type adapted to be mounted on a truck adjacent the truck bed, leaving the truck bed clear, for use in unloading or loading the truck or the like, and comprising;

boom means;

hoist means on said boom means;

a vertical support column, said boom means being swingably mounted on the upper end of said column, and said support column being rotatably mounted for rotating said boom means and said column in unison;

drive gear means located adjacent the lower end of a said support column for rotating the same;

rack means meshing with said drive gear means and moveable to and fro along a linear path relative to said drive gear;

a non-rotatable vertically oriented housing means supporting and enclosing a portion of said vertical column and said gear means adapted for mounting in fixed position on a portion of said truck, and supporting said vertical column along a substantial portion of its length;

power operated means connected with said rack means, and mounted on said housing, for driving said rack means to and fro thereby rotating said support column and said boom means in unison on either side of said truck bed further said power operated means includes a cylinder means; a protective shield member covering a portion of said power operated means, said shield member being in the shape of a shell having a semi-circular cross section and covered at each end by a plate having the shape of a half circle such that the plane of the open portion of said shield member bisects said cylinder means along its longitudinal axis, said rack means comprises an elongated linear rack member having tooth means on one side, adapted to engage said drive gear means, the other side of said rack member being flat and smooth, said rack member being located within said cylinder means and moving along a predetermined linear reciprocal path to and fro therewithin, and including a pressure pad located within said cylinder means and engaging said flat, smooth side of said rack member for holding the same with said tooth means in engagement with said drive gear means, said pad having a substantially rectangular contact surface with said flat, smooth side of said rack member, and adjustment means including two adjustable threaded means for adjustment of the pressure applied by said pressure pad on said rack member, further said protective shield member having an opening to permit access to said adjustment means;

supporting frame members forming part of said housing means for supporting vertical column, and extending from a lower portion of said housing means at an angle downwardly on opposite sides thereof;

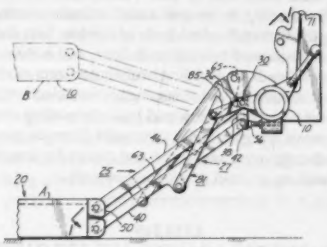
ground engaging strut means swingably attached to the lower outer ends of said frame members, and,

power cylinder means extending between the upper end of said housing means above said frame means and respective said strut means, operation of said power cylinder means swinging said strut means between upwardly angled disengaged positions and downwardly angled ground engaging positions, said power cylinder means thereby directly supporting and stabilizing the upper end of said vertical housing and said column enclosed therein against heavy loads applied at the end of said boom means, when said boom means are swung outwardly on one or other side of said truck.

4,111,317
PLATFORM LIFT

Morris D. Robinson, 179 Via Los Mira Dores, Redondo Beach, Calif. 90277

Filed Aug. 29, 1977, Ser. No. 828,814
Int. Cl.[2] B60P 1/48
U.S. Cl. 214—77 P 14 Claims

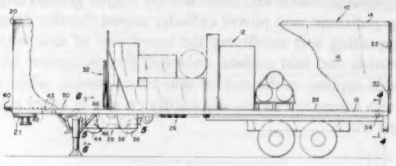


1. A platform lift for operation relative to support structure comprising: a platform adapted to assume a first substantially horizontal lower position, a second substantially horizontal upper position, and an upper erect position; hinge means attachable to the attachment member and to the platform for moving a platform selectively between the said positions, said hinge comprising a parallelogram linkage including a base link pivotally mounted to a principal pivot, said pivot being adapted to be attached to the support structure, a first parallelogram link pivotally connected to said base link at a point spaced from the principal pivot, a second parallelogram link pivotally connected to the principal pivot, the pivots of the first and second parallelogram link being substantially equally spaced apart, and a platform link mounted to the platform and pivotally connected to both of two parallelogram links at a space substantially equal to that of the spacing of pivots on the base link, whereby to form said parallelogram linkage; motor means connected to said support structure; limit means adapted to be connected to said support structure for determining the angular position of the base link in one mode of operation; and restraint means for determining the parallelogram configuration in another mode of operation, said restraint means comprising a member having a contact surface adapted to be connected to said support structure, and a scissor linkage having a first and second scissor link respectively pivotally connected to the first parallelogram link and adapted to be pivotally connected to the support structure, said scissor links being pivotally joined by last named hinge means, said hinge means being adapted to contact said contact surface in one position of the restraint means, said restraint means bing removable from said position.

4,111,318
LOADING AND UNLOADING APPARATUS FOR VEHICLES

David Edward Lutz, 300 Washington La., Carlisle, Pa. 17103

Continuation of Ser. No. 543,608, Jan. 23, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,406
Int. Cl.[2] B60P *1/36*
U.S. Cl. 214—83.22 23 Claims

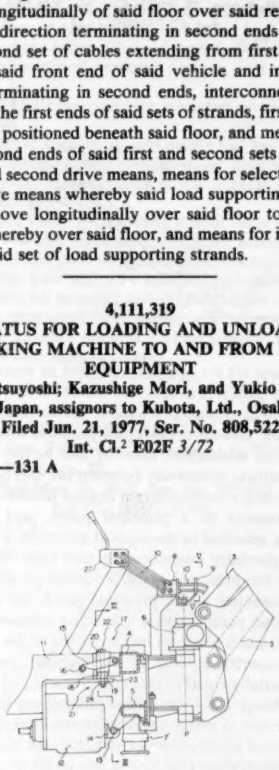


1. A loading and unloading apparatus for a vehicle having a framework, a load carrying floor mounted on said framework, said floor having front and rear ends and a top surface, a set of load supporting flexible strands on said floor extending from first ends longitudinally of said floor over said rear end and in the reverse direction terminating in second ends beneath said floor, a second set of cables extending from first ends on said floor over said front end of said vehicle and in the reverse direction terminating in second ends, interconnecting means connecting the first ends of said sets of strands, first and second drive means positioned beneath said floor, and means connecting said second ends of said first and second sets of strands to said first and second drive means, means for selectively actuating said drive means whereby said load supporting strands are caused to move longitudinally over said floor to move loads supported thereby over said floor, and means for insuring even takeup of said set of load supporting strands.

4,111,319
APPARATUS FOR LOADING AND UNLOADING A WORKING MACHINE TO AND FROM MAIN EQUIPMENT

Hideaki Matsuyoshi; Kazushige Mori, and Yukio Shimono, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jun. 21, 1977, Ser. No. 808,522
Int. Cl.[2] E02F *3/72*
U.S. Cl. 214—131 A 4 Claims



1. An improved apparatus for loading and unloading a working machine to and from main equipment, comprising:

main equipment (1) provided with a pair of upper and lower supporting members (11) and (12);

a hydraulically operated working machine (2) provided wth a pair of upper and lower fixtures (4) and (5) in a position corresponding to said upper and lower supporting members (11) and (12);

engagement projections (16) disposed at said upper supporting member (11);

engagement hooks (14) disposed at said lower supporting member (12);

latch arms (15) disposed at said upper fixture (4) and adapted to engage said engagement projections (16);

fitting pins (13) disposed at said lower fixture (5) and adapted to engage said engagement hooks (14);

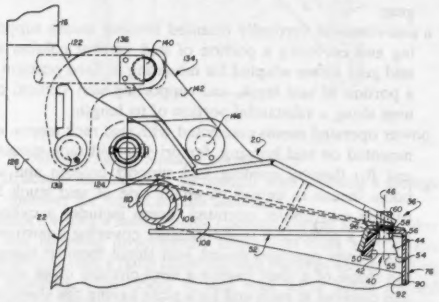
said improvement comprising:

a wedge assembly means employing a slidably disposed member formed to move within a pre-defined spaced formed between a support member having a vertically oriented end surface and an upper fixture having an inclined end surface; a support plate disposed below said support member and upper fixture extending beneath said pre-defined space for defining the extent of downward travel of said slidably disposed member; fastening means in working relationship with said slidably disposed member, for defining the extent of vertical travel within said predefined space, said fastening means being formed to co-act with said support member; latch means pivotally affixed to said upper fixture; projection means projecting from said support member adapted to engage a working end of said latch means, whereby downward movement of said slidably disposed member urges said latch means to be placed into tension in response to the respective movement of said support member and said upper fixture.

4,111,320
MATERIAL HANDLING APPARATUS HAVING MEANS FOR CONNECTING MATERIAL HANDLING TOOL WITH A BOOM

Robert D. Breeding, New Philadelphia, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Mar. 23, 1977, Ser. No. 780,316
Int. Cl.[2] E02F *3/96*
U.S. Cl. 214—145 A 9 Claims



5. A material handling apparatus comprising a boom, adapter means connected with an end portion of said boom for engaging a material handling tool, said adapter means having a bottom surface area, a material handling tool having a top surface area adapted to engage said bottom surface area of said adapter means, and connector means for releasably interconnecting said adapter means and said material handling tool with said top surface area of said material handling tool in abutting engagement with said bottom surface area of said adapter means, said connector means including a wedge member having first and second opposite side surfaces extending at an acute angle relative to each other, a first wedge surface area fixedly connected with said material handling tool and extending transversely to said top surface area of said material handling tool, a second wedge surface area connected with said adapter means and extending transversely to said bottom surface area of said adapter means, said first and second wedge surface areas extending at the same acute angle relative to each other as do the first and second side surfaces of said wedge

member, and fastener means for moving said wedge member relative to said first and second wedge surface areas to move said side surfaces on said wedge member into tight abutting engagement with said first and second wedge surface areas, for pressing said top surface area of said material handling tool into tight abutting engagement with said bottom surface area of said adapter means, and for preventing relative movement between said first and second wedge surface areas and said wedge member upon application of operating loads to said materi.' handling tool, said fastener means including a member connected with said wedge member at a location between said first and second wedge surface areas and extending through openings formed in said top and bottom surface areas of said material handling tool and adapter means.

4,111,321

MECHANISMS FOR LOADING AND UNLOADING CONTAINERS ONTO AND FROM A VEHICLE

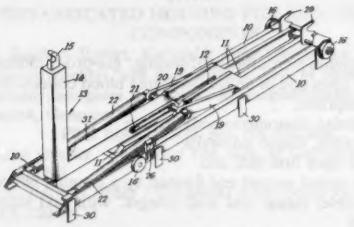
Raymond George Webster, Bolton, England, assignor to Edbro Limited, Lancashire, England

Filed Dec. 30, 1976, Ser. No. 755,469

Claims priority, application United Kingdom, Jan. 9, 1976, 872/76

Int. Cl.[2] B60P *1/14*

U.S. Cl. 214—501 **22 Claims**



1. A mechanism for loading and unloading a container onto and from a vehicle, the mechanism comprising:

a member having one end thereof adapted for releasable connection to the container;

pivot means mounted at an end of the member opposite to said one end;

an elongated guide means adapted to be connected to the vehicle and in which the pivot means is movable;

link means which towards one end thereof is pivotally mounte.. on the guide means;

second pivot means carried by the link means towards an end thereof opposite said one end of said link means;

a second guide means on the member in which the second pivot means are movable;

a first actuator means acting on the first mentioned pivot means to move the member and the first mentioned pivot means between a loaded position and an unloading position in which the first mentioned pivot means are held against further movement along the guide means with the engagement between the first mentioned pivot means and the first mentioned guide means and the second pivot means and the second guide means constraining the member to a fixed path between the loaded and unloading positions;

a second actuator means which acts on the member and which with the member in the unloading position, is operable to pivot the member about the first mentioned pivot means and the link means about the second pivot means; and

whereby the member in moving from the loaded position to the unloading position moves the container from a position in which the container is mounted on the vehicle for transport thereby, to a position in which, as the member in the unloading position is pivoted by the second actuator means, the member lifts and unloads the container from the vehicle, the operation of the first and second actuator means being reversible to load the container onto the vehicle.

4,111,322

SYNTHETIC PLASTIC CAP FOR BOTTLES

Albert Obrist, Therwilerstrasse 12, 4153 Reinach, Switzerland, and Dietmar Aichinger, Arlesheim, Switzerland, assignors to Albert Obrist AG, Reinach, Switzerland

Continuation-in-part of Ser. No. 689,920, May 25, 1976, abandoned. This application Jan. 7, 1977, Ser. No. 757,691

Int. Cl.[2] B65D *41/00*

U.S. Cl. 215—230 **8 Claims**

1. Synthetic plastic closure cap for bottles, consisting of a cylindrical part and a top plate integral therewith, the upper side of which bears printed material, characterised by an elevated portion provided on the upper side and extending approximately concentrically with said cylindrical part in the marginal region of the upper side of said top plate and surrounding said printed material so as to provide protection of the printed material against mechanical damage, the elevated portion rising gradually at such a shallow angle that even the elevated portion is readily printable at least in a partial zone thereof.

4,111,323

CROWN CLOSURE

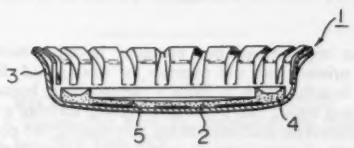
Isao Ichinose; Mitsuhiro Sakemoto, both of Hiratsuka, and Noboru Suzuki, Chigasaki, all of Japan, assignors to Japan Crown Cork Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1977, Ser. No. 774,651

Claims priority, application Japan, Mar. 17, 1976, 51-28121; Apr. 23, 1976, 51-45436

Int. Cl.[2] B65D *41/12*

U.S. Cl. 215—230 **10 Claims**

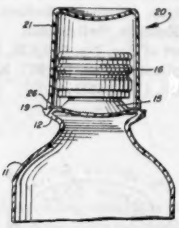


1. A crown closure having a removable polyolefin liner, said crown closure comprising a crown shell having a primer layer on its inner surface and the polyolefin liner applied to the inside of said crown shell, characterized in that said primer layer is a two-component priming consisting of an under coat layer containing a polyethylene oxide and a top coat layer containing a polyethylene oxide and at least one other compatible resin, with the provision of a printing layer of indicia at the interface between said under coat and top coat layers or atop said top coat layer.

4,111,324
HERMETICALLY SEALED TAMPERPROOF PORT PROTECTOR

David A. Winchell, Twin Lakes, Wis., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 14, 1977, Ser. No. 777,748
Int. Cl.[2] B65D *41/00*
U.S. Cl. 215—232 7 Claims

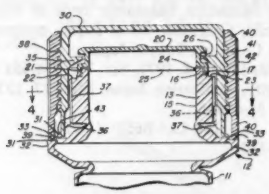


1. A container having a neck portion surrounding an outlet, the improvement comprising a cup-shaped protective closure covering said outlet, said protective closure having a body portion bonded to the neck portion and defining a frangible section adjacent to the bond, said protective closure forming a sterile hermetically sealed environment over the outlet capable of withstanding normal pressure differential stresses, said protective closure having a length to diameter ratio providing good mechanical advantage leverage to rupture the frangible section when the protective closure is pushed sideways.

4,111,325
SEALED CLOSURE FOR PLASTIC CONTAINER WITH INTERLOCKING PROTECTIVE OUTER CLOSURE

David Bellamy, Kenilworth, Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 777,749, Mar. 14, 1977, abandoned. This application Jan. 23, 1978, Ser. No. 871,320
Int. Cl.[2] B65D *41/32*
U.S. Cl. 215—232 11 Claims

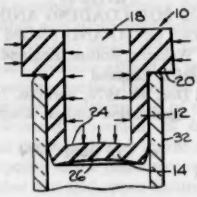


1. An improvement in a container having a hermetically sealed primary cap and overcap for storing and dispensing sterile liquids, which includes a thermoplastic bottle with a dispensing outlet, said bottle and overcap forming a unit that has a transverse abutment means surrounding the outlet, said improvement comprising, in combination: a bottle neck with a pouring lip surrounding the dispensing outlet; a primary cap including a top wall and an area hermetically fused to said bottle neck closing the dispensing outlet and having a thin frangible section at said fused area; an overcap covering said primary cap and bottle neck and having an area hermetically fused to said container proximate said abutment means and provided with a thin frangible section at said fused area; an outer ring over said overcap and overlying said transverse abutment means; interlocking means interconnecting said primary cap and said overcap limiting relative axial movement thereof, whereby upward axial movement of said overcap will jack said primary cap off said bottle neck; interlocking means interconnecting said overcap and said bottle neck limiting relative rotational movement thereof; and jacking means interconnecting said outer ring and said overcap, whereby rotation of said outer ring against said transverse abutment means moves said overcap axially upwardly to sever said frangible sections.

4,111,326
CLOSURE FOR AIR EVACUATED CONTAINER

Edward P. Percarpio, North Haledon, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Continuation-in-part of Ser. No. 663,921, Mar. 4, 1976, abandoned. This application Oct. 5, 1976, Ser. No. 729,643
Int. Cl.[2] B65D *47/36*
U.S. Cl. 215—247 7 Claims



1. A cannula-pierceable, self-sealing, gas-proof closure for sealing an open end of an air evacuated blood collection tube, which comprises;

(a) a tubular elastomeric body having
  (i) flexible, elastic sidewalls;
  (ii) an open first end; and
  (iii) a closed second end formed by a cannula pierceable, flexible, elastic end wall integral with said sidewalls; and

(b) a flange disposed radially about the periphery of said sidewalls adjacent to said first end; said end wall having a convex inner surface and a concave outer surface when pressure on inner and on outer surfaces is equal, said tubular body having a diameter which bears a ratio to the height of the body of about 0.8:1 and to the thickness of the second end of from 5.4:1 to 12.1:1; whereby when the closure is emplaced in and sealing an open end of an air-evacuated tube, the higher pressure on the convex inner surface of the end wall as compared to the lower pressure (vacuum) exerting itself on the concave outer surface creates a pressure differential on the end wall, flexing and flattening the concavo-convex configuration and creating a radial force directed toward the periphery of the end wall, said force affecting a restraining and sealing force between the closed second end of the elastomeric body and the air-evacuated tube.

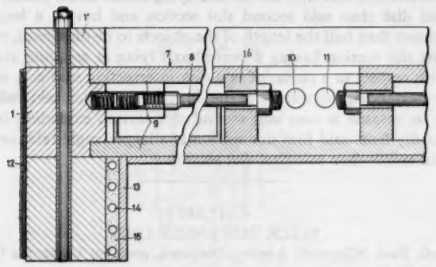
4,111,327
PRESSURE VESSEL

Nikolai Janakiev, Frankenring 44, 4150 Krefeld, Fed. Rep. of Germany

Filed Jan. 27, 1976, Ser. No. 652,853
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1975, 2503511
Int. Cl.[2] B65D *45/02, 45/32*
U.S. Cl. 220—3 5 Claims

1. A pressure vessel comprising: a cylindrical wall formed of courses of a plurality of flat circularly arcuate segmental plates each plate being axially traversed by a plurality of openings disposed in a symmetrical pattern or array at least some of the holes in adjacent courses being in alignment, and wherein the ends of the plates in each course overlap the ends of the plates in an adjacent course, and wherein locating sleeves are inserted in said aligned openings, and through each of the said locating

sleeves prestressing means selected from a tensioning cable and a tie rod is extended and is secured at the top and the bottom of said wall; a double-walled floor extending across said cylindrical wall inserted in a said course adjacent the bottom, said



double-walled floor containing a prestressing element radially extending from a said wall plate to securing means in said floor and adjustable tensioning means for adjusting the tension in said prestressing element; and a double-walled cover extending across said cylindrical wall adjacent said top.

4,111,328

PREFABRICATED HOUSING FOR ELECTRICAL COMPONENTS

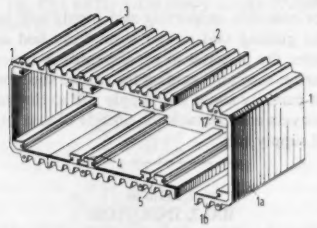
Hans Joachim Eggert, Karlsfeld; Otto Oberberger, Gilching; Heinrich Zenkert, and Rudi Küehne, both of Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 7, 1976, Ser. No. 684,080

Claims priority, application Fed. Rep. of Germany, May 26, 1975, 2523292

Int. Cl.² B65D *7/00;* H02G *3/08;* B65D *7/42*

U.S. Cl. 220—4 R **1 Claim**



1. A housing construction for electrical components comprising

(A) two spaced, opposed, flattened side wall members;

(B) two spaced, opposed, flattened end wall members;

(C) each one of said side wall and end wall members being an extruded profile comprised of an aluminum alloy;

(D) each one of said side wall members being further characterized by having integrally defined therein a plurality of spaced, parallel channel members which extend through and thereacross, and also a plurality of spaced, parallel T-grooves which extend thereacross, said T-grooves being in spaced, parallel alternating relationship with said rib members and being defined in a common face thereof;

(E) each one of said end wall members being further characterized by having transversely extending across each one of a pair of opposed edge portions thereof, a surface portion which terminates along a common face thereof and which is also defined to make a mating and abuting engagement with one of a pair of opposed end edge portions of each one of said side wall members;

(F) wall joining means mounting said side wall members in such engagement with said end wall members and which screens the resulting joints against electromagnetic fields and also seals said resulting joints against penetration of water and water vapor;

(G) said T-grooves being adapted to receive therein slidably nut means of bolt and nut assembly means; and

(H) said channel members being adapted to stiffen said housing construction and to dissipate heat generated therewithin.

4,111,329

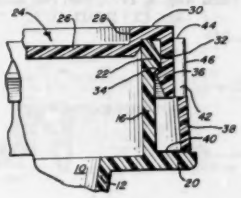
CONTAINER WITH TAMPERPROOF AND STACKABLE LID

John Edward Lampman, 117 W. Walnut Ave., Moorestown, N.J. 08057

Filed Sep. 19, 1977, Ser. No. 834,113

Int. Cl.² B65D *41/32*

U.S. Cl. 220—266 **12 Claims**



1. A container and cap assembly, including a container having an opening defined by an annular rim; a cap having a closed top portion and an annular skirt depending therefrom, said skirt having an internal dimension cooperative with the external dimension of said annular rim so as to overlie said annular rim snugly, the improvement comprising, in combination: a peripheral flange carried by said rim and extending radially outwardly therefrom, said peripheral flange being positioned to underlie said annular skirt and be adjacent thereto so as to prevent lifting of said cap off said rim when said cap is in a closed position on said rim and overlying said peripheral flange; said skirt comprising an upper portion and a lower portion with the lower portion being adapted to be torn away from the upper portion by an operator to enable access to the skirt, permitting the cap to be removed from the container; a plurality of frangible ribs connecting the upper portion of the skirt to the lower portion thereof, said frangible ribs extending radially outwardly from the upper portion; and means for enabling access to the lower portion, said enabling means being dimensioned so as not to protrude from the lower portion.

4,111,330

RECLOSABLE VACUUM CONTAINER

Thomas F. Jordan, Oak Park, Ill., assignor to The Continental Group, Inc., New York, N.Y.

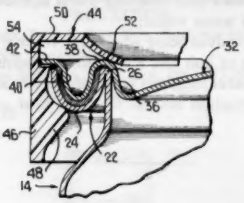
Filed Oct. 31, 1977, Ser. No. 847,108

Int. Cl.² B65D *41/16*

U.S. Cl. 220—306 **18 Claims**

1. A reclosable container comprising a container body having an open end defined by a peripheral finish, said finish extending outwardly of an adjacent portion of said container body and defining a shoulder, said finish defining a continuous sealing cavity facing away from said shoulder, a closure member, said closure member having a peripheral depending rib seated in said sealing cavity, and a retaining ring releasably securing said closure member to said container body, said

retaining ring having a flange overlying said closure member and a depending skirt surrounding said peripheral finish, said



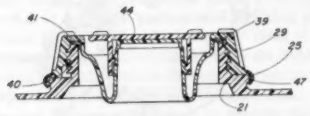
skirt including an inwardly directed projection underlying said shoulder.

4,111,331

TAMPER-PROOF CLOSURE DEVICE

Kenneth L. Summers, Angola, Ind., assignor to Riehe Corporation, Auburn, Ind.

Filed Aug. 4, 1977, Ser. No. 821,802
Int. Cl.² B65D *45/32*
U.S. Cl. 220—319 **22 Claims**



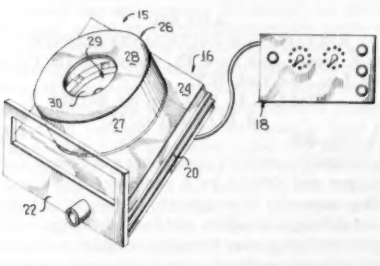
1. A tamper-proof closure device for use with containers which comprises:
- an internally threaded and closed cap member having a flared annular skirt portion around its base;
- a crimping ring shaped into a retained position around said cap member and overlapping said flared annular skirt portion; and
- said crimping ring being deformable to press said flared annular skirt portion into secured sealing engagement with a raised outlet in a suitable container such that said container is sealed closed.

4,111,332

ARTICLE COUNTING DEVICE

Kerney J. Hurst, Rte. 1, Box 172-L, and Walter G. Pearson, 104 Hilltop Dr., both of Pineville, La. 71360

Continuation of Ser. No. 288,737, Sep. 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 187,771, Oct. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 25,709, Apr. 6, 1970, abandoned. This application Dec. 16, 1974, Ser. No. 533,255
Int. Cl.² B65B *57/20*
U.S. Cl. 221—7 **37 Claims**



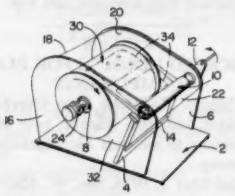
9. An article of commerce to be employed to dispense individually discrete objects comprising a circular flat disk having a top surface and a bottom surface, said bottom surface having a plurality of slots extending inwardly from adjacent the periphery of said disk and equally spaced from one another along said bottom surface, each said slot having a first and a second slot section, said first slot section lying closer to the center of said disk than said second slot section and having a length greater than half the length of the objects to be dispensed, said first slot section having a central axis lying at an acute angle with respect to a radius of said disk intersecting said axis, said slot extending outwardly in the direction in which said disk is to be rotated in use, said second slot section extending outwardly from said first slot section at a larger angle relative to said radius than said first slot section.

4,111,333

SLICE DISPENSER UNIT

Erik Bach Nörgaard, Auning, Denmark, assignor to Borden Ost A/S, Denmark

Filed Oct. 6, 1976, Ser. No. 729,985
Claims priority, application Denmark, Oct. 8, 1975, 4518/75
Int. Cl.² B65H *5/28*
U.S. Cl. 221—73 **20 Claims**



20. A dispenser unit for dispensing material from a supply roll which includes a rolled up length of a carrier sheet on which the material to be dispensed is placed, said dispenser unit comprising:
- means for rotatably supporting said supply roll; and
- means for guiding said carrier sheet from said supply roll and, after the material to be dispensed is removed from said carrier sheet, for guiding the carrier sheet back to and at least partially about said supply roll so that said carrier sheet covers and contacts the outside of at least a portion of said supply roll.

4,111,334

BALL INJECTOR

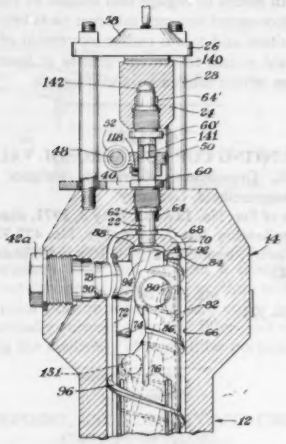
Fred M. Winn, Jr., Tulsa, Okla., and Monty E. Harris, Agua Dulce, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 8, 1976, Ser. No. 739,917
Int. Cl.² B65G *29/00*
U.S. Cl. 221—75 **8 Claims**

1. Apparatus for dispensing ball-like objects which comprises:
- (a) a housing including an axially aligned tubular bore;
- (b) a cylindrical rotatable tubular sleeve having an inwardly extending spiral element extending from one end of said sleeve to the other;
- (c) a non-rotatable shaft having at least one helical rib, an upper end and a base end, said shaft being coaxially mounted within said sleeve to form a plurality of separate object receiving compartments;
- (d) means including an array of sealable bores disposed around the circumference of said housing, said sealable bores extending through said housing and into said tubular bore and communicating with an alignable array of bores disposed in the upper end part of said rotatable tubular sleeve when said rotatable sleeve is in a predetermined

position for introducing ball like objects into said compartments, and removable plug elements for sealing said bores;

(e) means for discharging said ball like objects from said compartments, and;



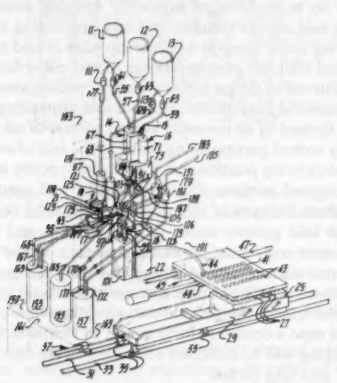
(f) means for rotating said sleeve whereby said compartments are successively aligned with said means for discharging said ball like objects from said compartments.

4,111,335

METERING SYSTEM

Satya Prakash Arya; Albert Stevens Ballard, and Stephen James Foster, all of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Mar. 15, 1976, Ser. No. 667,026
Int. Cl.[2] B67D 5/08; G01G 13/00, 17/04
U.S. Cl. 222—57 **6 Claims**



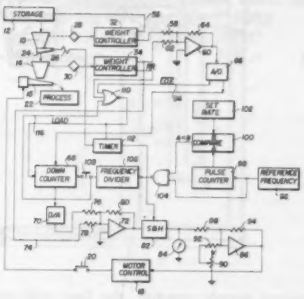
1. A particle metering system comprising, first, second and third particle reservoirs, coarse feeder means for dispensing a predetermined volume of first, second and third types of particles from each of said reservoirs, respectively, means for weighing the volumetrically dispensed particles from said first and second reservoirs, first and second fine feeder means for dispensing an additional amount of first and second particles sufficient to equal a predetermined weight for each of the first and second particles, a volumetric chamber for receiving the first, second and third types of particles from said coarse feeder means and said first and second fine feeder means, means for volumetrically dispensing the third type of particles to said volumetric chamber in a quantity sufficient to establish a predetermined total volume of particles therein, and a particle drainage system and retrieval means for transporting the first and second particles to said drainage system when the weight of the volumetrically dispensed particles thereof is outside a predetermined range.

4,111,336

WEIGHT LOSS CONTROL SYSTEM

William H. Ward, Oak Ridge; Henry F. Henderson, Jr., West Paterson, and Kenneth H. Kardux, Wayne, all of N.J., assignors to H. F. Henderson Industries, West Caldwell, N.J.

Filed Apr. 14, 1977, Ser. No. 787,688
Int. Cl.[2] B65G 27/24
U.S. Cl. 222—58 **14 Claims**



1. In a material feeding apparatus having a first storage means for storing a preselected weight of material, a transfer means at the outlet of said first storage means, a second storage at the outlet of said transfer means for storing material, a continuous feed means at the outlet of said second storage means and control means for operating said transfer means and said continuous feed means the improvement being said control means which comprises:

first measuring means for measuring the weight of material in said first storage means;

second measuring means for continuously measuring the weight of material in said second storage means;

logic means for providing a control signal for said continuous feed means as a function of the weight measurement of said second measuring means relative to the sum of weight measurements of said first and second measuring means prior to opening of said transfer means.

4,111,337

COFFEE BREWER WITH MEANS FOR DISPENSING CONTROLLED QUANTITIES OF HOT WATER

Edward Lerner, 3 Marshall St., Irvington, N.J. 07111, and John A. Ventura, 32 Jefferson St., Nutley, N.J. 07110

Filed Dec. 13, 1974, Ser. No. 532,366
Int. Cl.[2] B67D 5/62
U.S. Cl. 222—146 HE **3 Claims**

1. A coffee brewer with means for dispensing controlled quantities of hot water comprising:

(a) a first water tank,

(b) means for heating water in the tank,

(c) water inlet means connected to the tank,

(d) a water discharge conduit connected at one end to the tank, the opposite end of the conduit being at a level beneath the first said end thereof,

(e) a second water tank,

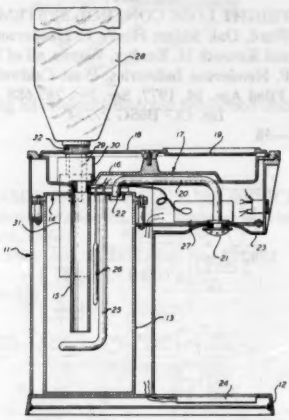
(f) a supply conduit separate from said water inlet means, said supply conduit connecting the first and second said water tanks, the end of the supply conduit in the first

water tank being at a level beneath the level of the end of the conduit in the said first water tank,

(g) The second water tank being closed except for said supply conduit and being positioned for gravity discharge into the said first water tank,

(h) a discharge conduit connected at one end to the first tank beneath the level of the end of the conduit therein,

(i) valve means operatively connected to the discharge conduit,



(j) a second supply conduit, the first said supply conduit extending therethrough, the second supply conduit extending downwardly into the first said tank to a level beneath the end of the first said supply conduit, and

(k) air vent means in the second supply conduit above the level of the end of the first supply conduit in the first water tank.

4,111,338

WALL MOUNTED ACTUATOR FOR AEROSOL CAN

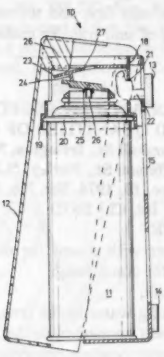
Robin Cheng, and Kenneth MacLean Cross, both of Penshurst, Australia, assignors to 3C Chemical Laboratories Pty. Limited, Penshurst, Australia

Filed Nov. 3, 1976, Ser. No. 738,211

Claims priority, application Australia, Mar. 16, 1976, PC5234

Int. Cl.[2] B05B *17/00*

U.S. Cl. 222—180 **4 Claims**



1. A combination to be mounted on a wall comprising a cap dimensioned to be fitted to and securely engage the top of a pressurized can with a dispensing nozzle, said cap having a flexible tongue to operate said nozzle; a holder dimensioned to surround and support within it the pressurized can with its dispensing nozzle, said holder having an outer casing of two parts, a pivot connecting the two parts thereby allowing limited pivotal movement between the two parts, one of the parts being adapted to engage said cap so as to support said can within said holder, and wherein the other of the two parts is provided with means to engage said tongue so that upon relative pivotal movement between said two parts beyond a predetermined position said means causes movement of said tongue to operate said nozzle to thereby release at least part of the contents from within said can via said nozzle.

4,111,339

MOUNTING CUP FOR AEROSOL VALVES

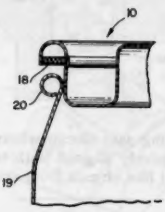
Ingo Schmidt, Grosshausen, Germany, assignor to Thomas GmbH, Langenselbold, Germany

Continuation of Ser. No. 139,403, May 3, 1971, abandoned. This application Jun. 7, 1974, Ser. No. 477,330

Claims priority, application Fed. Rep. of Germany, May 3, 1970, 2021643

Int. Cl.[2] B65D *83/14*

U.S. Cl. 222—394 **5 Claims**



1. A valve lid for spray nozzles comprising a cupola member having an annular base extending radially outwardly from the lowermost peripheral edge of the cupola, said cupola being provided with means for receiving a spray nozzle, an upstanding cylindrical wall integral at its bottom edge with the base of said cupola member concentric with the side of said cupola member so as to form an upwardly opening annular space between said cupola member and said upstanding cylindrical wall, a ring collar integral with the top edge of said upstanding cylindrical wall, the peripheral edge of said collar being downwardly curved to define a downwardly opening annular channel, a groove at the circumference of said upstanding cylindrical wall formed by an inwardly arched portion of said wall said inwardly arched portion being radial to the axis of said cupola, said groove being positioned substantially opposite said downwardly curved portion of said ring collar and spaced downwardly from the apex of said curved collar, a flat ring packing fitting in said groove under its own tension and extending radially outwardly from the external surface of said groove to the internal surface of said downwardly curved portion near the tip thereof for axial displacement out of said groove and against the apex section of said curved collar when placing the valve lid onto a container to be closed by the lid whereby said ring packing will be deflected according to the cross-sectional form of said ring collar.

4,111,340

POURING SPOUT FOR THREADED NECK CONTAINERS

Geoffrey Greenhow, 1019 Scenic Dr., Hamilton, Ontario, Canada (L9C1H8), and Peter N. Greenhow, 305 W. Jackson St., Bourbon, Ind. 46504

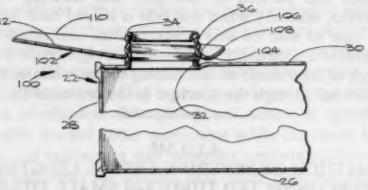
Filed Apr. 1, 1975, Ser. No. 564,030

Int. Cl.[2] B65D *25/48*

U.S. Cl. 222—527 **7 Claims**

5. A pouring spout for containers of the type having a tubular filler neck, which comprises:

said pouring spout comprises a filler-neck engaging collar portion of resilient material that circumscribes a filler-neck opening, that extends radially outward from said filler-neck opening, and that includes an outer periphery; an open trough portion that is integral with said collar portion, that extends radially outward from a part of said outer periphery, and that includes a trough extending radially outward from said collar portion; and



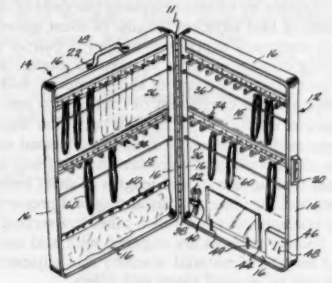
thinned annular portion means of said collar portion, that extends radially outward from said filler-neck opening, for increasing the resiliency of said collar portion.

4,111,341

NEEDLEPOINT, EMBROIDERY AND CREWEL CARRYING CASE

Camelita R. Carrozo, 11990 S. Boulder Rd., Lafayette, Colo. 80026

Filed Apr. 27, 1977, Ser. No. 791,421
Int. Cl.[2] A41H *31/00*
U.S. Cl. 223—106 9 Claims



1. A needlepoint, embroidery and crewel carrying case for conveniently carrying equipment and materials necessary for such work comprising

a pair of recessed case members each having marginal sidewalls and an outer wall, said case members being hinged together so as to be closable so as to bring the marginal sidewalls, respectively, into engagement thereby forming a closed case;

said case further including on the interior thereof a plurality of hook assemblies each including a plurality of spaced apart, interiorly extending hooks for holding skeins of yarn in a separated condition each of said hook assemblies including a supporting bracket mounted to the interior of said case members, and holding means to which said hooks are attached for detachably holding said hooks on said supporting bracket, and said supporting bracket comprising an elongated, generally C-shaped bracket extending substantially across the width of said case member;

means defining a recess provided adjacent each of said hooks for receiving therein tabs for identifying the skeins of yarn, said recess means being formed from transparent material so that the identification tabs retained therein are visible therethrough, and said recess means further comprising an elongated rib secured to the exterior of and extending vertically away from said supporting bracket and spaced from the interior wall of said case member so as to define a space therebetween, the side of said rib directed toward the interior wall of said case member being provided with a plurality of spaced apart projections so as to define a plurality of separated recesses therebetween into which the identification tabs can be retained said projections preventing the lateral movement of such tabs; and

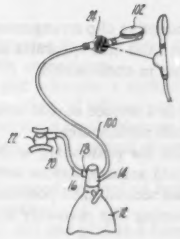
said carrying case further including at least one pocket means for holding equipment necessarily involved in needlepoint, embroidery and crewel type of work.

4,111,342

BREATHING APPARATUS

Gary R. Kirby, 38300 Mallast, Mt. Clemens, Mich. 48043

Filed Aug. 19, 1976, Ser. No. 715,992
Int. Cl.[2] F16K *37/00*; F16L *29/00*
U.S. Cl. 137—557 5 Claims



1. A breathing apparatus of the type having a tank adapted to be pressurized with a breathable gas, pressure reducing means fluidly coupled to the outlet of said tank and a pressure gauge line having a pressure gauge at one end and fluidly coupled to the pressure reducing means at its other end wherein said gauge provides an indication of the fluid pressure in said tank, the improvement comprising:

a normally closed fluid connector connected to said pressure gauge line and adapted for fluid connection to a like fluid connector on a second pressure gauge line whereby upon connection of two fluid connectors fluid communication between the pressure gauge lines is established wherein said fluid connector comprises a housing, a normally closed disc-shaped valve member rotatably carried by the housing between a first and second rotational position wherein said valve member is closed in the first rotational position;

said fluid connector having a first fluid port in communication with said pressure gauge line and a second fluid port on said valve member, first passage means extending substantially coaxially through said housing and said valve member between said fluid ports;

second passage means extending through said housing at a position radially spaced from said first passage means and open at one end to the first port;

third passage means extending through said valve member at a position radially spaced from said first passage means, said third passage means having one end open to said second fluid port, wherein the other ends of said second and third passage means are in registry when said valve member is in its second position;

a valve responsive to the differential pressure between said first and second passage means whereby said valve closes said first passage means when the pressure in said second passage means equals or exceeds the pressure in said first passage means; and

means for detachably connecting said fluid connector with a

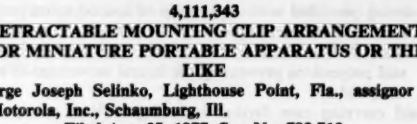
like fluid connector whereby said valve member opens upon said connection to permit fluid communication between the fluid ports.

4,111,343

RETRACTABLE MOUNTING CLIP ARRANGEMENT FOR MINIATURE PORTABLE APPARATUS OR THE LIKE

George Joseph Selinko, Lighthouse Point, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 25, 1977, Ser. No. 790,712
Int. Cl.[2] A45C *11/00*
U.S. Cl. 224—5 H 5 Claims



1. A retractable mounting clip arrangement especially suited for use with portable, hand-held apparatus intended to be worn on a person, including in combination:

a housing

a recess provided in a surface of said housing and including an arcuate bottom surface area;

a curved base plate for positioning within said recess and slidable along said arcuate bottom surface of said recess between first and second fixed positions;

an elongated mounting clip pivotably secured to said base plate; and

means for slidably securing said curved base plate within said housing recess,

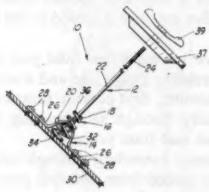
said mounting clip being substantially flush with the surface of said housing when said base plate and attached mounting clip is in said first and slidable position, and wherein said mounting clip is at a level above the surface of said housing when said base plate and attached mounting clip is in said second slidable position.

4,111,344

SPARE TIRE AND WHEEL SECURING DEVICE

Archie T. MacDonald, P.O. Box 483, McPherson, Kans. 67460

Filed Jan. 17, 1977, Ser. No. 760,036
Int. Cl.[2] B62D *43/10*
U.S. Cl. 224—42.24 5 Claims



1. A spare tire and wheel securing device for mounting on the floor of a vehicle, the device extending through an aperture in the center of the wheel and threadably attached to a nut for securing the tire and wheel therebetween, the device comprising:

a looped mounting bracket having end portions secured to the floor of the vechile and an outwardly extending looped center portion;

an elongated bolt having a curved lower end portion, an elongated center portion, and a threaded upper end portion, the curved lower end portion received through the looped center portion of said bracket, the threaded upper end portion receiving the nut; and

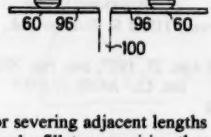
biasing means for biasing said bolt outwardly from said bracket and holding said bolt at substantially right angles from the floor of the vehicle, said biasing means engaging the looped center portion of said bracket and the curved lower end portion of said bolt and securing aid bolt thereto, whereby when said bolt is moved back and forth or side to side on said bracket when contacted by the wheel it is returned to substantially a right angle from the floor of the vehicle of said biasing means when said bolt is received through the aperture in the center of the wheel.

4,111,345

METHOD OF SEVERING USEFUL LENGTHS INTERCONNECTED THROUGH SMALL FILLETS

Franz Vossen, Op dem Felde 26, 4055 Niederkrüchten, Fed. Rep. of Germany

Division of Ser. No. 545,181, Jan. 29, 1975, Pat. No. 3,999,694.
This application Oct. 26, 1976, Ser. No. 735,613
Claims priority, application Fed. Rep. of Germany, Feb 1, 1974, 2404840
Int. Cl.[2] B26F *3/02*
U.S. Cl. 225—1 4 Claims



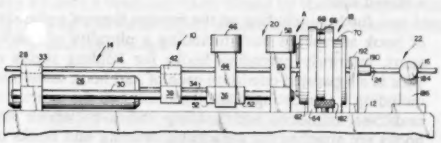
1. A method for severing adjacent lengths of sheet material connected together by fillets comprising the steps of disposing a first surface of said adjacent lengths of sheet material on a substantially stationary support, providing a pair of pressure fingers having contact surfaces adapted to engage a second surface of said adjacent lengths of sheet material, said contact surfaces having a first coefficient of friction and said support having a second coefficient of friction such that friction created between said contact surfaces and said second surface of said lengths of sheet material is greater than the friction created between said first surface of said lengths of sheet material and said support, and then laterally displacing said pressure fingers from a first position away from each other to a second position when said contact surfaces are engaged with said second surface of said lengths of material whereby said adjacent lengths of material will be severed along said fillets.

4,111,346

TUBE CUTTING MACHINE WITH BREAK-OFF MEANS

Reed Bertolette, Woodbury, Conn., assignor to Bertolette Machines, Inc., Torrington, Conn.

Filed Jan. 11, 1977, Ser. No. 758,417
Int. Cl.[2] B26F *3/00;* B26D *3/08, 3/16;* B23B *5/14*
U.S. Cl. 225—96.5 18 Claims



1. In a tube cutting machine having a cutting station, the combination of power feed means for axially advancing an elongated section of tubing whereby successively to present at said cutting station trailing end portions of leading end tube sections to be severed, intermittently operable clamping means successively engageable with said section of tubing rearwardly

of said trailing end portions to secure the same for cutting, a centrally apertured rotary cutting head at said cutting station adapted successively to receive said leading end tube sections, said head having at least one small rotary cutter adjacent said central aperture mounted for generally radial inward and outward movement respectively to engage and cut said leading end tube sections at their trailing end portions and to withdraw from engagement therewith, power operated means for rotating said cutter head and for intermittently moving said rotary cutter inwardly and outwardly for successive cutting operations, said means including a precise and positive mechanism which is mechanical throughout and which is operable to effect radial inward cutter movement while the cutter head is rotating, and said means also including separate positive drive means respectively for rotating said cutter head and for causing said mechanical mechanism to effect said radial inward cutter movement, adjustable means operable on the positive drive means for the positive mechanical mechanism effecting cutter movement and imposing a positive limit on said mechanism to precisely limit inward cutter movement in accordance with tube diameter and wall thickness whereby to provide a circumferentially uniform partial cut of controlled depth at each said trailing end portion, and intermittently operable means for successively applying sharp generally radially directed forces to leading end sections forwardly of their trailing edge portions whereby successively to break off said sections subsequent to said partial cutting operations.

4,111,347

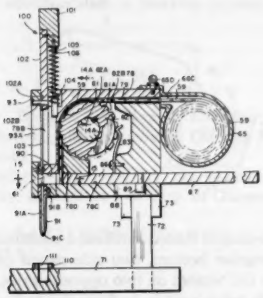
FASTENER ATTACHMENT APPARATUS

Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 720,705, Sep. 7, 1976, abandoned, which is a continuation of Ser. No. 512,676, Oct. 4, 1974, abandoned, which is a division of Ser. No. 347,679, Apr. 4, 1973, Pat. No. 3,875,648. This application Jun. 22, 1977, Ser. No. 808,843

Int. Cl.[2] B25C *1/00*

U.S. Cl. 227—68 **6 Claims**



1. Apparatus for dispensing fasteners comprising means for feeding a set of connected fasteners, each comprising two end members and a filament connected therebetween, along a first path;

means for severing the two end members to form an individual fastener comprising a filament coupled between the two end members;

and means for feeding one of said end members along a second path through a slotted hollow needle, while permitting the other of said end members to move without confinement said second path being a continuation of said first path that is laterally displaced therefrom.

4,111,348

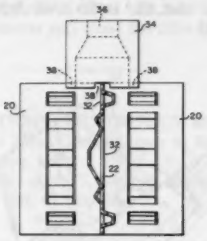
GRID BRAZE APPLICATION MOLD

Willy S. Laird, West Columbia, and Ben O. Kendall, Orangeburg, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 9, 1977, Ser. No. 775,807

Int. Cl.[2] B23K *31/02, 37/04, 3/06*

U.S. Cl. 228—181 **10 Claims**



1. A method of brazing together grid straps of a grid of a nuclear fuel assembly comprising:

assembling said grid whereby a multiplicity of said straps intersect defining lines of intersection;

placing a mold having a cavity thereon on said straps near their intersection and in vertical alignment with said line of intersection;

placing a predetermined amount of braze material in said cavity of said mold;

placing said mold and said grid in a furnace;

heating said grid and said mold until said braze material melts and flows downward by gravity along said lines of intersection thereby contacting the adjoining straps and filling spaces between said straps; and

cooling said grid and said mold thus solidifying said braze material and thereby establishing a permanent brazed joint along said line of intersection and permanently joining said straps.

4,111,349

CUPS, PLATES, TRAYS OR CONTAINERS FORMED FROM LAMINATES CONTAINING FILLED POLYSTYRENE

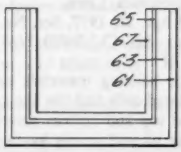
Ernest Jack Buckler, and Michael Hugh Richmond, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Sep. 14, 1976, Ser. No. 723,283

Claims priority, application Canada, Oct. 22, 1975, 238303

Int. Cl.[2] B65D *1/00, 5/20*

U.S. Cl. 229—3.5 R **9 Claims**



1. A thermoplastic polymeric laminate comprising at least one layer of filled styrene polymer composition containing from about 5 to about 50 parts by weight of filler and at least one layer of a dissimilar polymer selected from a polyolefin and a nitrile group containing polymer, said filled styrene polymer composition being the product of mixing a styrene polymer masterbatch with polystyrene, said styrene polymer masterbatch comprising 100 parts by weight of impact polystyrene, from 1 to 40 parts by weight of rubber, from 10 to 200

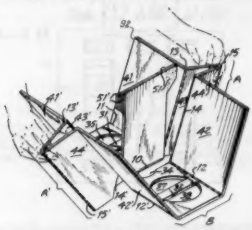
parts by weight of filler and from 1 to 40 parts by weight of mineral oil.

4,111,350

SIX-CELL CONTAINER DIVIDER

Thomas P. Hambleton, Kansas City, Mo., assignor to International Paper Company, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,082
Int. Cl.[2] B65D *5/48, 3/24*
U.S. Cl. 229—15 **14 Claims**



1. A substantially rectangular blank for a six-celled divider, said blank comprising, in combination:

(a) a central tongue having integrally attached and laterally extending protruding tabs at the top of said tongue to form a T-shaped tongue;

(b) said central tongue being foldably connected only to a first floor panel along a horizontal score line;

(c) a pair of first wall panels flanking and foldably connected to said first floor panel;

(d) a third wall panel foldably connected to each of said first wall panels;

(e) a fourth wall panel foldably connected to each of said third wall panels;

(f) a second wall panel foldably connected to each of said fourth wall panels;

(g) a second floor panel foldably connecting said second wall panels;

(h) said third and fourth wall panels lying in an abutting relation to said central tongue, said central tongue being slit from said third and fourth wall panels whereby the tongue can swing about said horizontal score line to an upstanding position upon assembly; and

(i) the width of each of said third and fourth wall panels being substantially equal to the length of said central tongue.

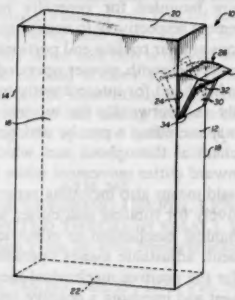
4,111,351

PAPERBOARD CARTON

Stuart W. Mackiernan, Canton, Mass., assignor to BesPak Corporation, Greenwich, Conn.

Filed Apr. 25, 1977, Ser. No. 790,454
Int. Cl.[2] B65D *5/76*
U.S. Cl. 229—17 M **8 Claims**

1. A carton for housing materials such as laundry soap, detergents, powdered milk and the like comprising a plurality of side panels and top and bottom panels for forming an enclosed carton, one of said panels having an opening therein, spout means received in said opening, said spout means comprising a front, a rear and two side walls adapted to form a spout container for holding said material, means for rotatably securing said spout means to said carton thereby to permit said spout means to move into and out of said carton upon the application of an external force, said front wall of said spout being adapted to seal said opening when said spout means is moved to a position fully within said carton and said rear wall being adapted to seal said opening when said spout means is moved to a position fully external to said carton, and wiper means operatively connected to said carton internally thereof and engaging said side walls of said spout means when said spout means moves from within said carton, thereby to form a seal at the side walls of said spout means effective to prevent leakage of material at said side walls, wherein said wiper means



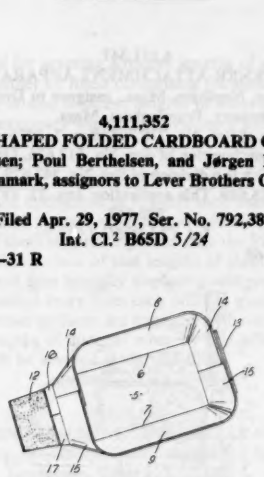
comprise two segments of said carton, each segment extending along an edge of said opening in said carton, said segments being folded along their length away from said opening inwardly of said carton.

4,111,352

TROUGH-SHAPED FOLDED CARDBOARD CONTAINER

Arne Jørgensen; Poul Berthelsen, and Jørgen Bassoe, all of Korsør, Denmark, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,381
Int. Cl.[2] B65D *5/24*
U.S. Cl. 229—31 R **3 Claims**

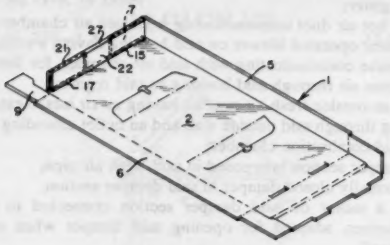


1. A trough-shaped folded cardboard container which comprises a rectangular bottom, two side panels extending from and hinged to the bottom on two opposite sides, extensions of the side panels being bent in to form the end walls, two end flaps extending from and hinged to the bottom at its two other opposite edges, gluing flaps hingedly connected to the lower edges of the extensions of the side panels by fold lines parallel to the lower edges of said extensions and, by means of fold lines starting from the corners of the bottom, also hingedly connected to the end flaps, said gluing flaps being folded and glued to the unfolded end flaps and said gluing flaps each having such a length that they abut edge-to-edge, and the end flaps with the gluing flaps on them being folded against the b at-in extensions of the side panels and joined to said exte. ions covering the vertical edges of said extensions as well as the gluing flaps, the end flaps extending over the full height of the container.

4,111,353
PARTITIONED TRAY AND MULTIPLE TRAY CONTAINER

Steven Collins, Lauderhill, and A. Wayne Fausett, Miami, both of Fla., assignors to Alton Box Board Company, Alton, Ill.

Filed Jun. 13, 1977, Ser. No. 805,720
Int. Cl.[2] B65D *5/26, 5/22, 5/48*
U.S. Cl. 229—34 R 15 Claims

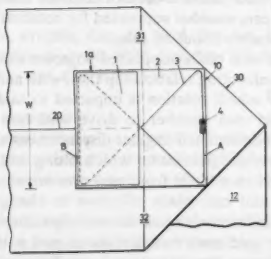


1. A plurality of partitioned trays each for use in holding a variety of packaged items and being stackable for insertion and retention within an enclosing container, each tray having perpendicularly arranged fixed side walls, end walls, and a bottom wall, and having an opened top, each end wall being formed as a double panel, said double panel being hinged together at their formed upper ends, one panel of each said double panel foldably connecting to the end edges of the bottom wall, the other panel of each double panel having at least one extension for cooperating with means formed of the bottom wall for accommodating the said panel extension therein for facilitating the double panel erection, each side wall foldably connecting to a side edge of the bottom wall, a tab provided integrally extending from the ends of each said wide wall, said tabs provided for extension into and retention between their approximate double panel end wall for fixing the said walls into a tray configuration, each tab further including an extension on one side, with said extension provided for cooperating with the means formed in the bottom wall for retaining said side walls and their tabs into their folded position, a series of partitions disposed within each tray and extending upwardly for defining spaced areas for accommodating the positioning of said packaged items, and a container being of a size to snugly accommodate a plurality of said item laden stacked trays.

4,111,354
VALVE BAG

Dieter Brünker, Bremen, Fed. Rep. of Germany, assignor to Anker-Schiffarts-Gesellschaft mbH & Co. KG, Bremen, Fed. Rep. of Germany

Filed Nov. 17, 1976, Ser. No. 742,536
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1975, 2552438
Int. Cl.[2] B65D *31/14, 33/30*
U.S. Cl. 229—62.5 15 Claims

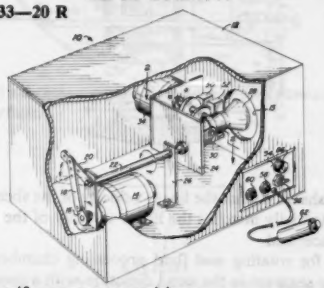


1. A valve bag for bulk material, comprising a tubular body with opposite ends, closure sections closing said opposite ends of the body, a filler valve secured to one of said closure sections, the filler valve including tube means extending through said one closure section and having inner and outer end parts, a fold line separating the inner and outer end parts and said outer end part being fastened to the one closure section, and spring means attached to said inner end part of said tube means and acting against said one closure section for folding over said inner part of the tube means about said fold line, thereby to pinch off the tube means and close the filler valve automatically.

4,111,355
MULTI-COMPARTMENT CENTRIFUGE ROTOR LINER

Kenzo Ishimaru, San Jose, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 15, 1977, Ser. No. 806,807
Int. Cl.[2] B04B *1/00*
U.S. Cl. 233—20 R 4 Claims



1. A centrifuge rotor comprising:
a lower portion of said rotor;
a liner member located within said lower portion of said rotor, said liner member having at least two compartments;
a thin membrane cover overlying said compartments;
a rigid disc member positioned over said membrane cover to cause said membrane cover to seal one of said compartments from the other of said compartments;
a rotor lid to secure said disc over said membrane cover and said liner member; and
means located within said rigid disc member and directly responsive to centrifugal forces for releasing said membrane from its sealing engagement with said one of said compartment to allow fluid communication between said compartments during centrifugation.

4,111,356
CENTRIFUGAL APPARATUS WITH FLEXIBLE SHEATH

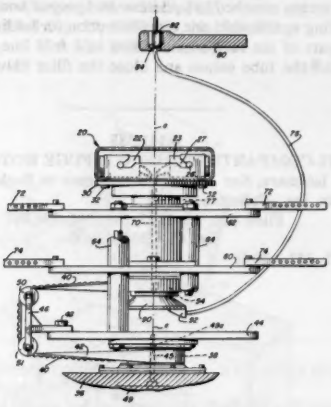
Daniel R. Boggs, Vernon Hills, and Richard I. Brown, Northbrook, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 13, 1977, Ser. No. 815,095
Int. Cl.[2] B04B *9/08*
U.S. Cl. 233—26 7 Claims

1. Centrifugal processing apparatus, which comprises:
a stationary base;
a processng chamber rotatably mounted with respect to said base for rotation about a predetermined axis;
a flexible umbilical cable segment for establishing fluid communication with said processing chamber, one end of said cable segment being fixed with respect to said base substantially along said axis at one side of said processing chamber, the other end of said cable segment being attached substantially on said axis in rotationally locked engagement to said processing chamber;
a guide member located along said cable segment, said guide member comprising a downwardly and outwardly tapering tubular support having an inner wall which defines an internal opening for receiving said cable segment;

a sheath surrounding said cable segment, said sheath having an outer surface contour conforming to the inner wall surface of the tubular support so that said outer surface and inner wall surface are substantially matched;

the radius of said sheath being variable along the length of



said sheath so that the linear velocity of the sheath surface substantially matches the linear velocity of the inner wall surface; and

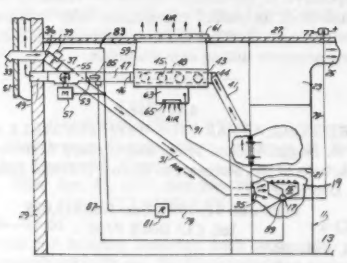
means for rotating said fluid processing chamber and said cable segment in the same direction with a speed ratio of 2:1, respectively.

4,111,357

HIGH ENERGY SAVING HEAT EXCHANGER FOR FURNACES

Walter L. Mieczkowski, 33611 Curcio, Sterling Heights, Mich. 48077

Filed Aug. 8, 1977, Ser. No. 822,553
Int. Cl.² F28F 1/10
U.S. Cl. 236—11 **11 Claims**



1. In a furnace for a building having a floor and an outside wall, said furnace having a combustion chamber, a burner with electric controls, a furnace heat exchanger and a hot exhaust pipe adapted for connection with a stack;

a high energy saving heat exchanger comprising a housing having an air chamber, an exhaust inlet connected to said furnace exhaust pipe and an exhaust outlet;

an exhaust conduit interconnecting said exhaust outlet and stack;

a continuous circuitous exhaust tubing nested within the air chamber of said housing, at one end connected to said exhaust inlet and at its other end connected to said exhaust outlet;

an exhaust fan section in said exhaust conduit mounted adjacent to said stack;

a motor operated exhaust fan in said fan section for drawing exhaust gases through said heat exchanger tubing and delivering said exhaust gases under pressure through said conduit into said stack;

a hot air duct interposed between said housing and said floor defining an area to the heated, and including a hot air register;

said hot air duct communicating with said air chamber;

a motor operated blower on said housing having a room air intake communicating with said air chamber, for forcing room air through said housing to said register;

and an outside fresh air conduit having an air intake extending through said outside wall and an outlet extending into said combustion chamber;

a damper section interposed in said fresh air pipe;

a normally closed damper in said damper section;

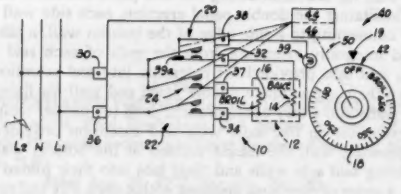
and a motor on said damper section connected to said damper, adapted for opening said damper when energized.

4,111,358

OVEN CONTROL

Alexander M. Semple, Oakville, Canada, assignor to Ranco Incorporated, Columbus, Ohio

Filed Mar. 23, 1977, Ser. No. 780,270
Int. Cl.² F23N 1/00
U.S. Cl. 236—15 A **7 Claims**



1. A control device for a cooking oven having bake and broil burners, the control comprising:

(a) a support base,

(b) three switches supported by said base and electrically connected in control circuits for the oven burners;

(c) manually operable selector means for selecting desired oven functions and oven temperature levels, said selector means comprising an operating member supported for rotation relative to said base;

(d) a thermostatic actuator supported by said base and cooperable with first and second of said switches and said selector means to govern burner operation in response to sensed oven temperature levels; and

(e) an oven function control actuator supported by said base and cooperable with a plurality of said switches and said operating member for enabling desired oven burner operation, said function control actuator comprising:

(i) a cam member supported for rotation by said operating member about an axis;

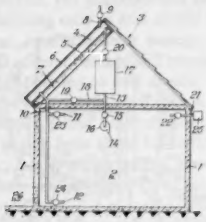
(ii) a cam blade supported adjacent said cam member in confronting relationship therewith and having a portion by which rotation is imparted to said cam blade from said cam member to drive said cam blade through a predetermined angular displacement about said axis and a second portion by which tilting motion is imparted to said cam blade from said cam member;

(iii) said cam blade effective to change the operational condition of one of said switches during rotation thereof by said cam member about said axis and effective to change the operational condition of another of said switches in response to tilting motion thereof.

4,111,359
DWELLINGS EQUIPPED WITH NATURAL AIRCONDITIONING INSTALLATIONS

Félix Trombe, Paris, and Jacques Michel, Neuilly-sur-Seine, both of France, assignors to Agence Nationale de Valorisation de la Recherche (Anvar), Neuilly-sur-Seine, France

Filed Oct. 22, 1976, Ser. No. 735,037
Claims priority, application France, Oct. 28, 1975, 75 32921; Jun. 30, 1976, 76 19960
Int. Cl.² F24J 3/02
U.S. Cl. 237—1 A 12 Claims



1. Dwelling equipped with an airconditioning installation comprising at least one inclined thermal enclosure forming at least a part of the roofing of the dwelling, an inner roof element bounding said thermal enclosure internally and essentially constituted by a collector material of very low thermal mass absorbing radiation of the solar radiation type of wavelength comprised between 0.25 and 4 microns, and an outer covering element bounding said thermal enclosure externally also of very low thermal mass, essentially constituted by a material behaving as an opaque body for infra-red radiation of wavelength comprised between 4 and 30 microns and hence capable of emitting said infra-red radiation, said outer covering element having sealing properties to water and to air, an upper duct forming a chimney directed upwards and provided with a closure member, connected to the upper part of the thermal enclosure and a lower duct directed downwards and opening into the dwelling through at least one orifice, connected to the lower part of said thermal enclosure, and a circulation duct opening into the dwelling and provided with a closure member in the vicinity of its opening, connected to the upper part of the thermal enclosure.

4,111,360
SOLAR ENERGY CONCENTRATING AND COLLECTING ARRANGEMENT AND METHOD

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.

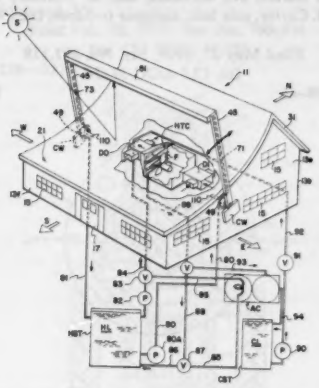
Division of Ser. No. 499,066, Aug. 20, 1974, Pat. No. 3,994,435. This application Nov. 30, 1976, Ser. No. 746,268
Int. Cl.² F24J 3/02
U.S. Cl. 237—1 A 18 Claims

1. The method comprising

reflecting and concentrating a portion of solar energy in light form from a concave concentrating light-transmitting reflector surface area onto a collector spaced thereabove,

and passing a further portion of said solar energy in light form through the same said light-transmitting reflector surface area for aid in illuminating the zone beneath said concentrating reflector surface area,

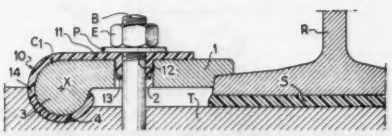
reflecting and concentrating said solar energy from a concave reflector surface onto a longitudinal collector movable in a direction across the width of said concave reflector surface.



4,111,361
DEVICE FOR INSULATING AND FASTENING RAILWAY RAILS

Roger Paul Sonneville, Saint-Cloud, France, assignor to Suprotec S.A., Fribourg, France

Filed Mar. 24, 1977, Ser. No. 780,999
Claims priority, application France, Apr. 8, 1976, 76 10233
Int. Cl.² E01B 9/28
U.S. Cl. 238—338 8 Claims



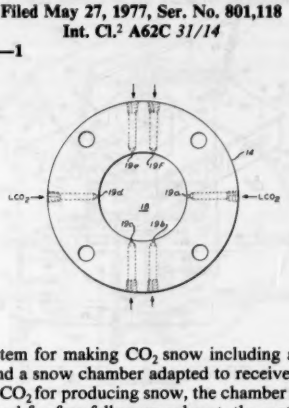
1. A device for fastening a rail provided with a flange to a support, said device comprising a metal fastener for bearing against the flange of the rail and against the support, fixing means for fixing the fastener to the support, at least one aperture formed in the fastener for the passage of the fixing means, and means for electrically insulating the fastener from the support and for electrically insulating the fastener from the fixing means, said insulating means comprising an insulating element which is constructed in one piece and which comprises a substantially planar branch which defines an aperture for the passage of the fixing means and a loop portion which is so shaped as to ensure the elastic mounting of the insulating element on the fastener and to insulate the fastener from the support, said loop portion having a generally cylindrical shape and having the shape, in a section in a plane perpendicular to the generatrices of the loop portion, of an arc of a circle which subtends an angle at the center exceeding 180°, said fastener having a partially cylindrical portion, and said arc of a circle having a radius slightly less than the radius of said partially cylindrical portion of the fastener, thereby providing a tight fit between said loop portion of said insulating element and said partially cylindrical portion of said fastener.

4,111,362

SYSTEM FOR MAKING CARBON DIOXIDE SNOW

Thomas A. Carter, Jr., deceased, late of Whittier, Calif., by Donna B. Carter, sole heir, assignor to Airco, Inc., Montvale, N.J.

Filed May 27, 1977, Ser. No. 801,118
Int. Cl.[2] A62C *31/14*
U.S. Cl. 239—1 **12 Claims**



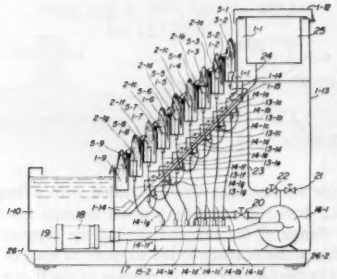
7. In a system for making CO_2 snow including a source of liquid CO_2 and a snow chamber adapted to receive expanding jets of liquid CO_2 for producing snow, the chamber being open at its lower end for free-fall snow exhaust: the method which comprises directing at least two jets of liquid CO_2 into the chamber from opposite sides thereof, and orienting the resulting snow-vapor jet mixtures so as to intersect and substantially dissipate the kinetic energy of the respective jets.

4,111,363

PORTABLE WATER FOUNTAIN DISPLAY APPARATUS

Koichi Kawamura, and Yoshiko Kawamura, both of No. 66 Jomyoji, Kamakura, Japan

Filed Feb. 23, 1977, Ser. No. 771,379
Claims priority, application Japan, Feb. 28, 1976, 51-20616
Int. Cl.[2] B05B *17/08*
U.S. Cl. 239—20 **7 Claims**



1. A unit type portable water fountain display apparatus comprising in combination:

a base pond,

stepwise ponds stacked over the base pond stepwisely to form a generally slanting display plane,

display nozzles arranged in desired location within the stepwise ponds and submerged below the water level of the respective pond when water is filled in the ponds to form desired display patterns,

electromagnetic valves coupled to the respective display nozzles and to a pressured water tank to eject water jet through respective nozzle when controlled to operate, and

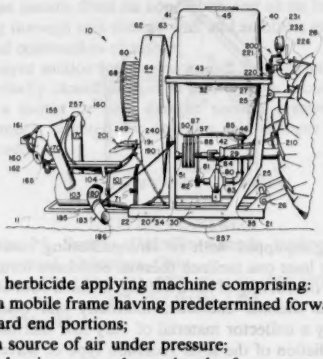
an electric control means to control the electromagnetic valves to form desired display patterns to indicate information such as time, characters and the like, wherein the electric control means is provided with a function to fill up the water in the stepwise ponds prior to the operation of the electromagnetic valves to provide display through the nozzles.

4,111,364

HERBICIDE APPLYING MACHINE

Merrill W. Schroeder, Fresno, Calif., assignor to Gerrit Vander Pol, Modesto, Calif.

Filed Dec. 27, 1976, Ser. No. 754,268
Int. Cl.[2] A01N *17/02*
U.S. Cl. 239—77 **4 Claims**



1. A herbicide applying machine comprising:

(A) a mobile frame having predetermined forward and rearward end portions;

(B) a source of air under pressure;

(C) cleaning means borne by the frame connected to said source adapted to discharge air from the source along the ground to displace debris from the ground adjacent to the frame;

(D) spraying means borne by the frame connected to said source adapted to discharge herbicide in an air stream from said source onto the soil in following relation to the cleaning means; and

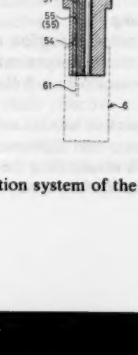
(E) a proportioning valve in said cleaning means and said spraying means for equally and oppositely regulating the air discharged through said means.

4,111,365

FUEL INJECTION SYSTEM AND ITS NOZZLE HOLDER

Motoyasu Kimbara, Yokohama, Japan, assignor to Isuzu Motors Limited, Japan

Continuation of Ser. No. 663,805, Mar. 4, 1976, abandoned, which is a continuation of Ser. No. 534,890, Dec. 20, 1974, abandoned. This application Jun. 17, 1977, Ser. No. 807,665
Claims priority, application Japan, Dec. 26, 1973, 49-3750; Dec. 28, 1973, 49-467
Int. Cl.[2] B05B *1/30*
U.S. Cl. 239—93 **2 Claims**



1. In a fuel injection system of the type including a nozzle,

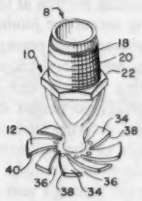
having a fuel discharge orifice and a fuel-receiving passage communicating with the orifice, and a nozzle holder coupled at one end to the nozzle and having a fuel flow passage communicating with the fuel-receiving passage of the nozzle, a needle valve controlling the nozzle orifice, and an adapter having an adapter passage communicating with the fuel flow passage, and further including a fuel injection pipe coupled to the adapter and communicating with the adapter passage, a cam-operated injection pump, and a delivery valve connecting the pump to the injection pipe to inject fuel into the fuel flow passage in the nozzle holder for delivery to the fuel receiving passage of the nozzle, the improvement comprising said fuel flow passage extending only in said nozzle holder and being a greatly elongated, small diameter passage communicating at one end with said adapter passage and terminating at the end of said nozzle holder coupled to said nozzle; said fuel flow passage in said nozzle holder being reduced in diameter, with the ratio F_3/F_1, when F_3 is the flow cross-sectional area of said injection pipe, ranging from about 0.5 to 0.15, over the length of said fuel flow passage which length, in said nozzle holder, is 90 to 30 times the inside diameter D_1 of said injection pipe, so that the fluctuation of fuel pressure in said injection pipe is converted to kinetic energy in said fuel flow passage, thereby to control abnormalities of fuel injection.

4,111,366

SPINNER NOZZLE FOR USE IN COOLING TOWER

Richard Donald DeWitte, Healdsburg, Calif., assignor to Dee-Mac Construction Co., Inc., Healdsburg, Calif.

Filed Mar. 4, 1976, Ser. No. 664,025
Int. Cl.[2] B05B *3/04*
U.S. Cl. 239—222.17 **25 Claims**



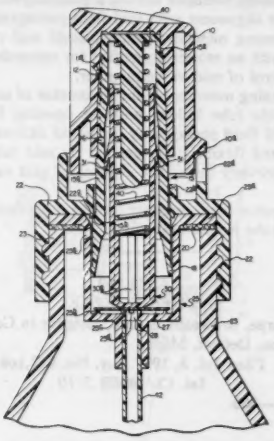
1. A nozzle comprising a connecting member and a spinner rotatably mounted on said connecting member, said connecting member defining an orifice for passage of fluid therethrough, and mounting means for mounting said spinner so that fluid passing out of said orifice engages and rotates said spinner, said spinner defining a central section and a plurality of arms projecting from said central section, each arm being spaced from adjacent arms by slots extending through said spinner, said slots respectively defined by the trailing edge of one arm and the leading edge of an adjacent arm, the trailing edge of at least some of said arms being inclined at an angle of 10° to 25° with respect to the travel direction of fluid passing out of said orifice, the leading edges of said at least some arms being parallel with respect to the travel direction of fluid passing out of said orifice, wherein the upper surfaces of at least some arms are flat surfaces which lie in the same plane, and wherein said upper surfaces are arranged transverse to the travel direction of fluid passing out of said orifice such that said upper surfaces have a greater dimension perpendicular to the travel direction of fluid passing out of said orifice than parallel thereto.

4,111,367

FINGER OPERATED SPRAY PUMP

Thomas H. Hayes, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 18, 1977, Ser. No. 769,934
Int. Cl.[2] B05B *11/00*
U.S. Cl. 239—333 **12 Claims**



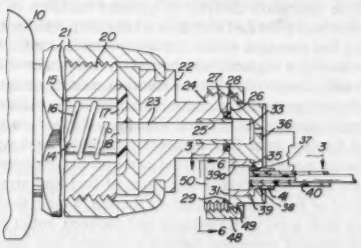
1. A finger-operated spray pump assembly comprising:
a. tank means having a bottom end and a top end;
b. primary piston means slidably fitted for upward and downward movement in said tank means, said primary piston means having liquid passageway means;
c. secondary piston means slidably fitted for upward and downward movement inside said primary piston means and said tank means; and
d. resilient means fitted inside said primary piston and said secondary piston means for biasing said primary piston means away from said secondary piston means.

4,111,368

DISPENSING APPARATUS

William L. Brehm, Plumsteadville, Pa., assignor to B & G Equipment Company, Plumsteadville, Pa.

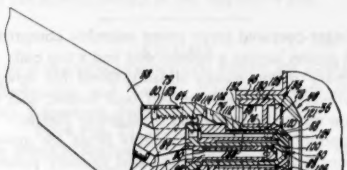
Continuation-in-part of Ser. No. 734,181, Oct. 20, 1976, abandoned, which is a continuation of Ser. No. 603,737, Aug. 11, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,822
Int. Cl.[2] B05B *1/16*
U.S. Cl. 239—394 **5 Claims**



1. Dispensing apparatus for attachment to a hand operated control valve for selective delivery of liquid or spray which comprises

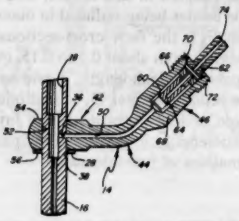
a connector plate member carried by said valve and having a fluid passageway,
a dispensing member mounted for selective positioning with respect to said fluid passageway,
a clamping member in detachable engagement with said dispensing member and retaining said dispensing member at a selected position,
said dispensing member having a plurality of openings for selective alignment with said fluid passageway,
said dispensing member having one of said openings provided with an atomizing orifice for spray delivery under the control of said valve member,
said dispensing member having in another of said openings a detachable tube holder with an opening for alignment with said fluid passageway for liquid delivery,
an elongated flexible tube carried by said tube holder for liquid delivery under the control of said valve member, and
said connector plate member having a portion for removal of said tube holder and tube.

4,111,369
FUEL NOZZLE
Cecil H. Sharpe, Brownsburg, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 5, 1977, Ser. No. 813,168
Int. Cl.[2] B05B *7/10*
U.S. Cl. 239—400 **3 Claims**



1. A fuel spray nozzle for disbursing liquid fuel into a combustion apparatus and wherein the nozzle is exposed to high temperature combustion within the combustion apparatus comprising: a nozzle strut end of solid metal having main and pilot fuel supply passages therethrough, an outboard recess in said strut end, a pilot nozzle having a base thereon removably supported within said recess, said pilot nozzle including an elongated tubular extension thereon with a pilot nozzle orifice at its end, a pilot fuel distributor tube slidably supported within said tubular extension, coacting means on said tubular extension and said pilot fuel distributor tube to define an air space and thermal barrier against heat transfer to fuel within said pilot fuel distributor tube during a heat soak mode of spray nozzle operation thereby to prevent build-up of fuel varnish within said pilot fuel distributor tube with resultant blockage of pilot fuel passages within the spray nozzle, a main fuel distributor having a segment telescoped on and removably supported by said elongated tubular extension, said segment including a fuel passage means in communication with said strut main fuel supply passage, an integral extension formed on said segment and having axial fuel passages communicated with said fuel passage means, said axial fuel passages having opposite aligned open ends for straight line flow of fuel and straight line removal of fuel varnish build up therein, a main fuel distributing ring with axial inlet passages and inclined outlet ports therein, said integral extension having a stepped ring support thereon to removably receive said fuel distributing ring and to locate it in spaced, overlying relationship to said pilot nozzle, air distributor means for supplying air to said pilot nozzle including a bushing in surrounding relationship to said main fuel distributor, said bushing including a locater shoulder thereon coacting with said main fuel distributor to hold it against said pilot nozzle base which is in turn held thereby against said nozzle strut end, means for removably connecting said bushing to said strut end for take apart assembly of said pilot nozzle, pilot fuel distributor tube and said main fuel distributor.

4,111,370
FUEL INLET FITTING FOR A FUEL INJECTION NOZZLE
Walter C. Chelgren, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 8, 1977, Ser. No. 785,795
Int. Cl.[2] F02M *55/02*
U.S. Cl. 239—533.3 **5 Claims**

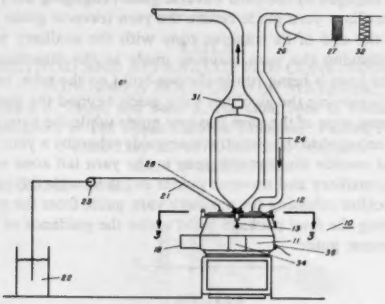


1. In combination with a fuel injection nozzle including a nozzle barrel having an axial bore communicating with a nozzle tip, a cylindrical external surface and a fuel port formed in the side wall thereof extending radially from the axial bore to a point at the cylindrical external surface permitting delivery of pressurized fuel thereto, an elongate integrally-formed unitary fuel inlet fitting having a fuel passage therethrough comprising a mounting portion at one end having a cylindrical bore intersecting said fuel passage defined by a cylindrical internal surface thereof, a coupling portion at the opposite end having a separable connecting means for joining said fuel inlet fitting to a fuel supply line with said fuel passage communicating with said fuel supply line, and a constricted connecting portion between said mounting portion and said coupling portion having sufficient ductility to permit deformation thereof as desired, the cylindrical external surface of the nozzle barrel and the internal surface of the mounting portion having substantially the same diameter to make a tight fit when said nozzle barrel is inserted through said mounting portion and said fuel passage is aligned with said fuel port to communicate therewith, and means for sealing the two annular joints defined between the cylindrical external surface of the nozzle barrel and the cylindrical internal surface of the mounting portion at the upper and lower surfaces of the mounting portion, whereby there are no other joints along the fitting except at the end thereof where the inlet fitting is connected to the fuel supply line.

4,111,371
GRANULATION PROCESS
Guido W. Melliger, Dover, N.J., assignor to Firma Dierks & Sohne Maschinenfabrik, Osnabrueck, Fed. Rep. of Germany
Division of Ser. No. 508,422, Sep. 23, 1974, Pat. No. 4,037,794.
This application May 9, 1977, Ser. No. 795,154
Int. Cl.[2] B02C *23/30*
U.S. Cl. 241—18 **6 Claims**

1. A one step batch process for the preparation of dry medicament granulations, which comprises the steps of:
(a) Blending the medicament formulation and granulating liquids in a mixing chamber;
(b) Introducing air into the mixing chamber;
(c) Maintaining the blend of medicament formulation and

granulating liquids in an agitated state in the chamber, while continuing air flow through the blend to dry it;
(d) Removing the air from the chamber;



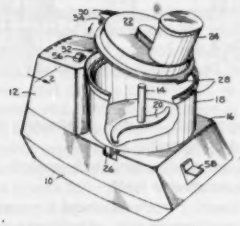
(e) Collecting fine-dry particles of the blend which exits from the chamber with the air in a collecting means and returning them to the chamber; and
(f) Removing the final dry blend from the mixing chamber for further processing.

4,111,372

FOOD PROCESSOR INTERLOCK

William R. Hicks, Spencerport, and Richard S. Woodard, Kent, both of N.Y., assignors to General Electric Company, Bridgeport, Conn.

Filed Apr. 25, 1977, Ser. No. 790,271
Int. Cl.[2] B02C *18/12*
U.S. Cl. 241—37.5 **5 Claims**



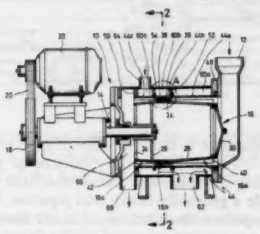
1. In a food processor having a power base with a bowl-supporting portion and driven shaft extending vertically therefrom, an adjacent upstanding motor-containing housing, a bowl on said portion containing a cutter on said shaft, and an internal switch-controlled motor energizing circuit, an improved interlock comprising,
a bowl lid,
means operatively securing said lid to the bowl opposite the motor housing on lid rotation axially of the shaft toward the housing,
a top housing opening at lid height opposite the securing means,
an arm on the lid movable from without into the opening on lid rotation,
releasable arm locking/switch activating means internally of said opening
whereby the circuit is deenergized by opening the internal switch and the processor rendered inoperative on lid removal.

4,111,373

APPARATUS FOR DEFIBERING CONGLOMERATES OF FIBER IN FIBROUS SUSPENSIONS, ESPECIALLY IN THE PROCESSING OF MIXED WASTE PAPER

Emil Holz, Eningen u.A., Fed. Rep. of Germany, assignor to Hermann Finckh Maschinenfabrik, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 776,520
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611886
Int. Cl.[2] B02C *23/36*
U.S. Cl. 241—46.11 **21 Claims**

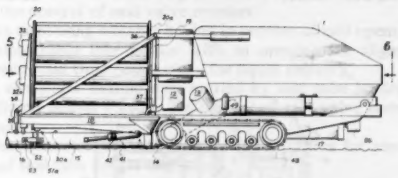


1. An apparatus for reducing conglomerates of fibers in fibrous suspensions, particularly useful with fibrous suspension of low stock density, comprising:
a housing, said housing having a first inlet for the fibrous suspension to be processed, a second inlet for dilution water, at least a first outlet for the processed fibrous suspension and a second outlet for the rejected part of the suspension;
a rotor mounted for rotation within said housing, said rotor having at least three regions along the direction of the rotor axis;
a first hollow cylinder surrounding the first of said rotor regions, at least the lower portion of said first cylinder being provided with perforations in the form of a screen, the outer surface of said first cylinder being in flow communication with said first outlet, the inner surface of said first cylinder and said first rotor region forming a first annular space into which the fibrous suspension entering through said first housing inlet flows and is set into rotation to centrifugally remove excess water and part of the fibers therefrom through said screen;
a second hollow cylinder surrounding the second of said rotor regions, the inner surface of said second hollow cylinder and said second rotor region forming a second annular space into which the remainder of said fibrous suspension with said fiber conglomerates therein flows, said second rotor region having means to effect the defibering of fiber conglomerates;
a stationary cylindrical screen surrounding the third of said rotor regions, the outer surface of said stationary screen being in flow communication with said first outlet for the processed suspension, the inner surface of said stationary cylindrical screen and said third rotor region forming a third annular space, said third annular space being in flow communication with said second annular space, said second inlet for dilution water and said second outlet, said dilution water serving to dilute the fibrous suspension in said third annular space to facilitate the passage of said fibrous suspension through said stationary cylindrical screen and into said first outlet and also serving to wash dirt particles from said fibrous suspension and into said second outlet.

4,111,374
COMMODITY CONVEYING MEANS

James B. Mackaness, 28 The Crescent, Cheltenham, N.S.W., Australia (2119)

Continuation-in-part of Ser. No. 655,441, Feb. 5, 1976, abandoned. This application May 31, 1977, Ser. No. 802,270
Claims priority, application Australia, Feb. 5, 1975, 0477/75
Int. Cl.[2] B02C *23/36*
U.S. Cl. 241—101.7 9 Claims

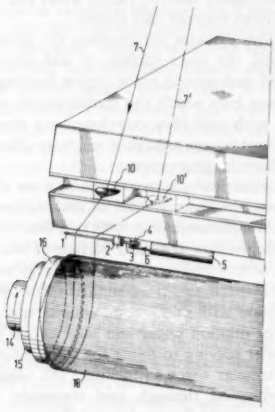


1. A mobile machine to store lengths of pipe to be added to and then removed from a generally horizontal pipeline connected to a mining machine, said mobile machine comprising a frame to straddle a generally horizontal pipeline, wheel means on the frame to permit the machine to move along the length of the pipeline, a magazine mounted on the frame and adapted to hold the lengths of pipe, pipe location means associated with the magazine and adapted to position any one of the lengths of pipe in a pipe transfer position in said magazine, pipe transfer means mounted on the machine and adapted to alternatively transfer a length of pipe from said pipe transfer position to a pipe handling position exterior of said magazine and return a length of pipe from the pipe handling position to the pipe transfer position, and pipe handling means to axially move the length of pipe in the pipe handling position relative to the machine to engage or disengage an end of the length of pipe with the end of the previously laid pipeline.

4,111,375
PROCESS AND EQUIPMENT FOR THE PRODUCTION OF A YARN TAIL

Meinolf Dolle, Berlin, Fed. Rep. of Germany, assignor to Spinnstoffabrik Zehlendorf Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,606
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614252
Int. Cl.[2] B65H *54/02, 54/34*
U.S. Cl. 242—18 PW 14 Claims

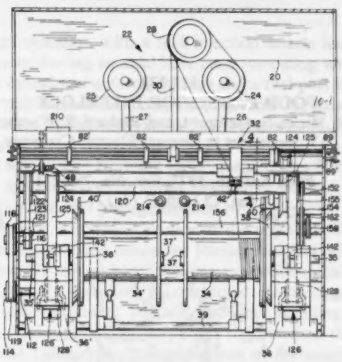


1. A process for producing a yarn tail on yarn package tubes upon which yarn is wound in a pattern including a traverse zone by the yarn traverse guide and a yarn tail zone disposed beyond the traverse zone by an auxiliary yarn guide comprising the steps of initially forming a yarn pre-build on a tube with the yarn engaged by the yarn traverse guide, engaging the yarn by the auxiliary yarn guide before the yarn traverse guide has reached the end of its traverse zone with the auxiliary yarn guide following the yarn traverse guide in the direction in which the yarn is being run in the pre-build on the tube, independently moving the auxiliary yarn guide beyond the end of the traverse zone of the yarn traverse guide while the yarn still remains engaged in the yarn traverse guide whereby a yarn tail is wound outside the traverse zone in the yarn tail zone with both the auxiliary and traverse guides engaged with the yarn, and thereafter releasing the auxiliary yarn guide from the yarn for forming the final package build under the guidance of the yarn traverse guide.

4,111,376
CONTINUOUS STRAND WINDING APPARATUS

David C. Hoddinott, N. Stonington, and Albert P. Brown, Gales Ferry, both of Conn., assignors to Crompton & Knowles Corporation, New York, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,751
Int. Cl.[2] B65H *54/02, 67/04*
U.S. Cl. 242—25 A 10 Claims



1. Winding apparatus for the continuous winding of an advancing strand comprising:

(a) a pair of co-axially mounted, spaced, independently driven, and removable reels;

(b) a pair of machine reels mounted for rotation with said reels about a common axis, one of said machine reels is mounted adjacent the remote end of one of said reels and the other is mounted adjacent the remote end of the other of said reels;

(c) snagger means disposed between the remote end of each of said reels and its associated machine reel and mounted for rotation with said machine reel;

(d) means for traversing strand onto one of said reels until a predetermined length of strand has been wound thereon;

(e) restraining means for temporarily restraining the strand and maintaining it in a winding relationship with the filled reel;

(f) means for rapidly moving the traverse means across the other reel into a position to direct said strand onto the machine reel associated with said other reel;

(g) means for withdrawing the restraining means thereby permitting the restrained strand to change its path to a path which intersects the path of the snagger means;

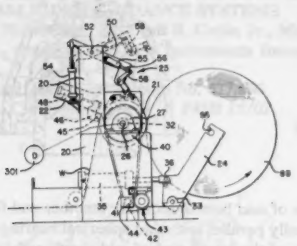
(h) means for severing the strand between the snagger and the filled reel after at least one revolution of strand has been wound onto the machine reel; and

(i) means for moving the traverse means into normal traversing relation with the other reel after a predetermined number of revolutions of strand has been wound onto said machine reel.

4,111,377
METHOD AND APPARATUS FOR CONTINUOUSLY WINDING A ROLL OF WEB MATERIAL

Richard S. Tetro, and Paul E. Harmon, both of Fulton, N.Y., assignors to The Black Clawson Company, Fulton, N.Y.

Filed May 23, 1977, Ser. No. 799,153
Int. Cl.[2] B65H *19/20*
U.S. Cl. 242—56 R **6 Claims**



1. In a continuous winder for web material including a frame, a driven drum supported in the frame for driving a roll of web material being wound, primary support means for supporting a core upon which a roll of web material is to be wound while the web is initially wrapped on the core, and secondary support means for accepting the core and winding roll from said primary support means and for supporting said core and roll during completion of the winding of the roll with the surface of the roll in driven engagement with the surface of the drum, the combination of:

(a) means mounting said primary support means for rotation on said frame in one direction through 360° about an axis concentric with the axis of rotation of the drum from an initial position wherein a core is mounted on said primary support means out of contact with the surface of the drum, through an intermediate position wherein said core is in contact with the web against the drum to a second position wherein said core is transferred to said secondary support means, and continuing rotation in the same direction to said initial position for acceptance of a new core,

(b) cutting means supported by the frame and operable with said primary support arms in said intermediate position to cut the web from a full roll for transfer to a core supported by said primary support means,

(c) guide means carried by said primary support means and effective in said intermediate position of said primary support means to support a length of the web out of engagement with the drum for cutting by said cutting means without contact with the drum, and

(d) means for causing movement of said cutting means along a predetermined path into engagement with said supported length of the web.

4,111,378
MEANS AND METHOD FOR PROVIDING INDICATING OF END PORTION OF WEB MATERIAL

Morris L. Barwick, Deer Park, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1977, Ser. No. 802,765
Int. Cl.[2] B65H *25/14, 25/32*
U.S. Cl. 242—57 **8 Claims**

1. Apparatus for sensing the end portion of the web material in a web transfer apparatus including web take-up means, the combination comprising:

a rotatably supported supply spool,

web material having an end portion coupled to the supply spool, said web having a first predetermined amount including the end portion positioned around the supply spool in a first direction and having a second predetermined and remaining amount positioned around the supply spool in a second and opposite direction whereby the supply spool rotates in a first direction during the removal

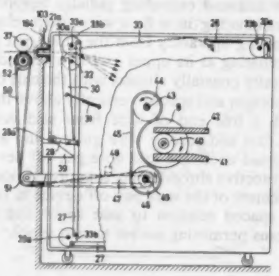
of the second predetermined amount of web material and rotates in a second and opposite direction during the removal of the first predetermined amount of web material, and

means to sense the change in direction of the rotation of the supply spool.

4,111,379
CASSETTE FOR STRIP MATERIAL

René Lüscher, Regensdorf, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Apr. 5, 1977, Ser. No. 784,856
Claims priority, application Switzerland, Apr. 13, 1976, 4675/76
Int. Cl.[2] G03B *1/04;* B65H *75/18*
U.S. Cl. 242—71.1 **15 Claims**



1. A cassette for strip material comprising:

(a) a light tight casing defining an opening through which strip material is admitted to or drawn from the casing,

(b) a door in the casing and within the casing,

(1) a hub for receiving a spool for strip material,

(2) means rotatably mounting said hub in said casing,

(3) means for coupling said mounting means to a drive external to the casing,

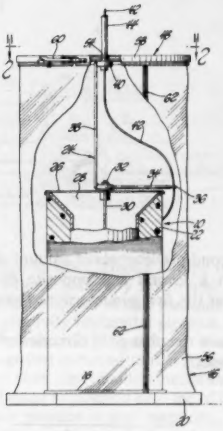
(4) a brake acting on said hub, said brake including a brake disc coupled to said hub and rotatable therewith and a brake band mounted on said casing and engageable with said brake disc, said means rotatably mounting said hub being adapted to move within said casing thereby disengaging said brake disc from said brake band; and

(5) a brake release mechanism adapted to be actuated from outside the casing.

4,111,380
WELDING WIRE SPOOL SHROUD

Carl C. Heuckroth, 101 Hemlock Dr., Lodi, Ohio 44254

Filed Jun. 14, 1977, Ser. No. 806,412
Int. Cl.[2] B65H 49/00
U.S. Cl. 242—128 3 Claims



1. An enclosed welding wire storage and feed system comprising a spool having an upright hollow cylindrical section, a pair of axially spaced, radially outwardly extending, circular flange members disposed at the respective ends of said cylindrical section, a multi-layered coil of welding wire wrapped about the cylindrical spool section and contained between said flange members, said wire wrapped spool being supported upon one of said flange members such that the other flange is disposed vertically above said one flange, a wire pay-off device supported in the upper end of said spool proximate said other flange, said device including a rotatable orbit arm, said orbit arm having a first end extending radially beyond said other flange and terminating in a first wire guide element, a leg element projecting upwardly from the other end of said orbit arm and terminating at its upper end in a second wire guide element generally coaxially aligned with the axis of said cylindrical spool portion and spaced vertically above the upper end of said spool, a free end of wire from said coil extending through said first and second wire guides, and a non-porous protective shroud enclosing said wire pay-off device and said spool, said protective shroud being supported upon the second wire guide element of the wire pay-off device in vertically and horizontally spaced relation to said spool and said shroud including means permitting access to said spool.

4,111,381
SUSPENSION SYSTEM OF BOBBIN HANGER

Shinzo Kitamura, No. 1-1-18, Deguchi, Hirakata, Japan

Filed Nov. 11, 1976, Ser. No. 741,051
Claims priority, application Japan, Nov. 11, 1975, 50-136111; Nov. 11, 1975, 50-154028[U]; Nov. 29, 1975, 50-161953[U]
Int. Cl.[2] B65H 49/02; D03J 5/08
U.S. Cl. 242—130.2 7 Claims

1. A suspension system for rotatably supporting a bobbin holder, comprising:

a shank forming a spherical bearing-race-receiving face at the lower end thereof with a neck part and a round trunk part being successively formed vertically therefrom;

a bearing race coaxial with said shank and having a lower concave spherical surface, said bearing race being supported on said spherical bearing-race receiving face of said shank;

a bobbin securing member having a convex spherical top face, said bobbin securing member being provided with a through-hole for receiving said shank, said through-hole being formed through the top part of said bobbin securing member and receiving said neck part of said shank and providing a broad clearance therebetween;

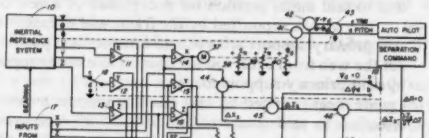
ball bearing means disposed between said bobbin securing member and said bearing race, for rotatably supporting said bobbin securing member from said shank through the intermediary of said bearing race; and

a cap plate being formed with a concave spherical surface substantially coinciding with the convex spherical top face of said bobbin securing member and formed concentrically parallel with said spherical bearing-race-receiving face of the lower end of said shank and having a central opening for receiving said trunk part of said shank, said central opening providing only a narrow clearance between said trunk part of said shank and said cap plate, whereby said cap plate prevents the intrusion of dust from above into the ball bearing section of said suspension system while permitting smooth rotation of said bobbin securing member through said ball bearing.

4,111,382
APPARATUS FOR COMPENSATING A BALLISTIC MISSILE FOR ATMOSPHERIC PERTURBATIONS

Charles W. Kissinger, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 297,468, Jul. 24, 1963, abandoned. This application Oct. 10, 1966, Ser. No. 586,010
Int. Cl.[2] F42B 15/12
U.S. Cl. 244—3.1 4 Claims



1. In an inertial guidance system for a ballistic missile, an analogue computer comprising

register means having preset voltages representing nominal azimuth and altitude position and velocity values of a programmed thrust termination point,

means producing voltages representing instantaneous values of azimuth and altitude positions and azimuth and altitude velocities of said missiles,

means subtracting the instantaneous position and velocity voltages from the nominal position and velocity voltages

respectively providing difference voltage output signals therefrom,

means multiplying each of said difference voltage signals by their respective derivates of range providing altitude and azimuth deviation voltage output signals,

means computing a deviation voltage output signal representing head and tail wind perturbations on range, and

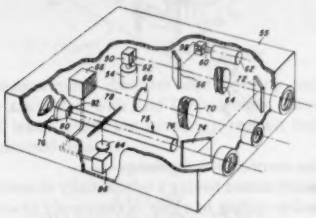
summing means adding said deviation voltages providing bearing correction and thrust cut off output control signals.

4,111,383

LASER BEAM TRANSMITTER SYSTEM FOR LASER BEAM RIDER GUIDANCE SYSTEMS

John B. Allen, Richardson, and Cecil R. Coale, Jr., McKinney, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 16, 1976, Ser. No. 677,636
Int. Cl.[2] F41G 7/00, 7/14; F42B 15/02
U.S. Cl. 244—3.13 **9 Claims**



1. A laser beam rider guidance system comprising:

(a) a launcher based electro-optical subsystem having a laser beam transmitter assembly operatively connected to an electro-optical sighting system for guiding an object to a point in space along a boresight axis, said laser beam transmitter assembly being operative for producing *x* and *y* scan beams and a synchronization beam in a preselected sequence along a common line of sight, said electro-optical sighting system comprising means for reflecting a portion of the *x* and *y* scanning beams, a sighting means for receiving the reflected portion of the *x* and *y* scanning beams, said sighting means including a means for determining line of sight, and an electrical signal producing means for producing electrical signals in response to the portions of the *x* and *y* scanning beams crossing the means for determining line of sight, said electrical signal producing means connected to the laser beam transmitting assembly for triggering the synchronization beam; and

(b) a laser beam receiver subsystem for mounting on a carrier, said laser beam receiver subsystem including means operative in response to *x-y* scanning beams and synchronization beams for producing *x-y* guidance signals in response to the time difference between the receipt of *x-y* scanning beams and corresponding synchronization beams and rate of scan for guiding the carrier to a destination corresponding to a point in space along the boresight axis.

4,111,384

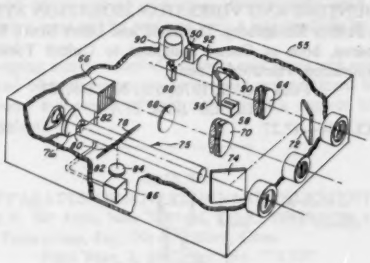
SCANNER SYSTEM FOR LASER BEAM RIDER GUIDANCE SYSTEMS

Erwin E. Cooper, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 16, 1976, Ser. No. 677,637
Int. Cl.[2] F41G 7/00, 7/14; F42B 15/02
U.S. Cl. 244—3.13 **7 Claims**

1. A laser beam rider guidance system comprising:

(a) a launcher based electro-optical subsystem having a laser beam transmitter assembly and a sighting assembly, said laser beam transmitter assembly including a stationary *x* and *y* coordinate laser beam producing means and a rotating scanning means in the light path of the *x* and *y* coordinate laser beam producing means for producing with each revolution at regular intervals a plurality of non-contiguous *x* and *y* laser scan beams in a field of view responsively to the beams of the *x* and *y* coordinate laser beam producing means, and a synchronization laser beam producing laser means, said sighting assembly including a light reflector means for reflecting portions of the *x and y* laser



scan beams to the sighting means, indicator means for indicating when the *x* and *y* laser scanning beams cross the line of sight indicator of the sight means, detector means for producing signals responsively to the indicator means output for losing the synchronization laser beam producing laser means; and

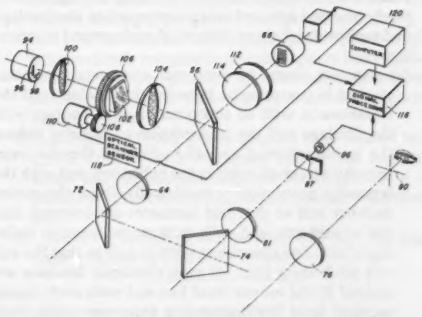
(b) an on-board carrier laser beam receiver subsystem for producing carrier guidance signals responsively to receipt of the *x* and *y* laser scan beams and corresponding laser synchronization beams.

4,111,385

LASER BEAM RIDER GUIDANCE SYSTEM

John B. Allen, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 16, 1976, Ser. No. 677,638
Int. Cl.[2] F42B 13/30; F41G 7/12, 7/14, 9/00
U.S. Cl. 244—3.13 **13 Claims**



1. A laser beam rider guidance system comprising:

(a) a launcher based electro-optical subsystem having a laser beam transmitter assembly and an electro-optical sighting assembly, said laser beam transmitter assembly including an *x* and *y* laser scan beam producing means and a synchronization laser beam producing means, said *x* and *y* laser scan beam producing means comprising first and second elongated solid state laser diode junctions for emitting long, narrow beams of light, respectively, in the *x* and *y* directions, said electro-optical sighting assembly including a sighting means for establishing a line of sight

to target, and means responsive to the x and y laser scan beams crossing the line of sight to target for actuating the synchronization beam; and

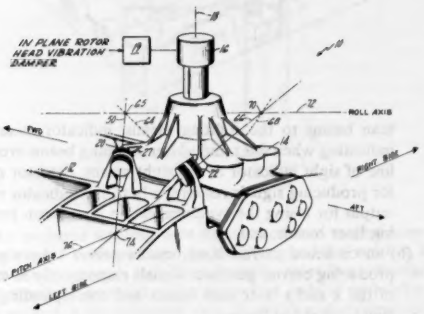
(b) a laser beam receiver subsystem for mounting onboard a carrier for producing guidance signals to guide the carrier to the target in response to receipt of the x–y scan beams and synchronization beams.

4,111,386

HELICOPTER ROTOR AND TRANSMISSION MOUNTING AND VIBRATION ISOLATION SYSTEM

Irwin Jeffrey Kenigsberg, Trumbull, and Larry Bruce Eastman, Monroe, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 9, 1976, Ser. No. 749,131
Int. Cl.[2] B64C *27/00*
U.S. Cl. 244—17.27 **10 Claims**



1. A helicopter having:

(A) a main lift rotor,

(B) a transmission supporting and driving the rotor for rotation about an axis of rotation,

(C) a fuselage, and

(D) a rotor and transmission support and vibration isolation system supporting the transmission from the fuselage and including:

(1) a plurality of elastomeric mount members each of selected compression stiffness and each having a selectively oriented axis and being connected to the fuselage and supporting the transmission therefrom and comprising:

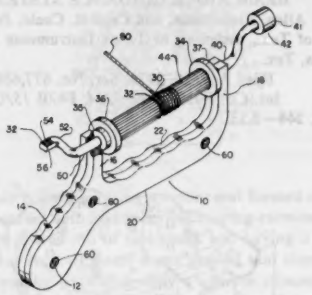
(a) alternate layers of elastomer and metal laminates stacked in compression between the fuselage and the transmission with an elastomer layer in contact with the fuselage and the transmission to thereby reduce the transmission of acoustic vibration therebetween to reduce internal noise in the helicopter and with the laminates positioned concentrically about the mount member axis so that said laminates are oriented normal to said axis, and with each mount member defining a focal line coincident with its axis so that the roll and pitch shear lines for each elastomer laminate are normal to the mount focal line and with each mount member focal line intersecting a corresponding focal line of other mount members so as to define a mount system roll axis extending longitudinally of the fuselage and displaced vertically on one side of said mount members and a mount system pitch axis extending transversely of the fuselage and displaced vertically on the other side of said mount members from said roll axis, and so that said axes are off-set from said mount members a selected distance to establish vibration isolation through said mount members between said fuselage and said transmission about both said pitch and said roll axes and so that with said system pitch and roll axes so positioned said mount members along provide substantial system yaw restraint which is accomplished by compression loading of the elastomer laminates of the mount members in response to transmission yaw motion.

4,111,387

KITE-CONTROLLER

John Joseph Leary, 7 High St., Natick, Mass. 01760

Filed Nov. 8, 1976, Ser. No. 739,615
Int. Cl.[2] A63H *27/08*
U.S. Cl. 244—155 A **3 Claims**



1. A kite-controller comprising:

(a) a handle means having a substantially eccentric U-shaped extension ending in a pair of outwardly extending legs;

(b) a spool means mounted between said legs and rotatable forwardly and reversibly;

(c) crank means fixedly mounted to said spool means at the outermost end of said substantially eccentric U-shaped extension of said handle means, to rotate said spool means;

(d) braking means having a substantially cylindrical member fixedly mounted to said spool means at one end and extending substantially perpendicular to said spool means for a portion thereof and then extending substantially parallel to said spool means to the end thereof, displacable from a first position distant said handle means to a second position adjacent said handle means and back thereto to brake said spool means, and having an elliptical end portion thereon defining a series of gripping grooves on the top surface thereof.

4,111,388

VERTICAL PIPE HOLDING TOOL

J. M. Presley, Rte. 4, Box 78, Enterprise, Ala. 36330

Filed May 18, 1977, Ser. No. 798,013
Int. Cl.[2] E21B *19/14*
U.S. Cl. 248—49 **16 Claims**

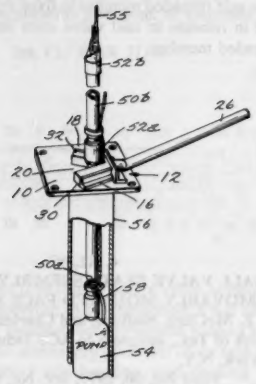
1. Apparatus for holding a vertically disposed pipe of a first predetermined diameter, said pipe having a portion having a second predetermined diameter greater than said first predetermined diameter, comprising in combination:

a base member including a slot extending inwardly a predetermined distance from one edge of said base member, said slot being wider than said second predetermined diameter;

first and second projecting members affixed to said base member, each having an interior surface transverse to said base member, said projecting member interior surfaces being disposed on opposite sides of said slot, and relatively disposed at an angle opening away from said one base member edge; and

a fork member, including a handle and first and second engaging members, said engaging members being affixed at one end to said handle member and extending outwardly therefrom, said engaging members having exterior transverse surfaces relatively disposed at an angle for

removably engaging said projecting member interior transverse surfaces, said fork member, when engaged, forming an opening with dimensions at least as great as said first predetermined diameter, but less than said second predetermined diameter said opening including a portion associated with said fork member interior angle apex of lesser width but extending beyond said second predetermined diameter.



4,111,389

COLUMN DRAWING TABLE

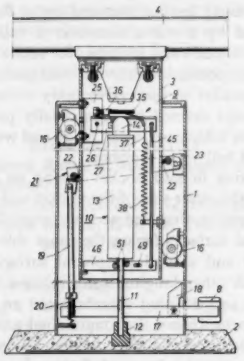
Arnold Gundlach, and Hans Eder, both of Wilhelmshaven, Germany, assignors to Franz Kuhlmann KG., Germany

Filed Aug. 31, 1977, Ser. No. 829,342

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646486

Int. Cl.[2] F16M *11/00*

U.S. Cl. 248—162 **11 Claims**



1. A column drawing table comprising:

a pedestal foot;

a pedestal mounted on said pedestal foot;

a column mounted in said pedestal for longitudinal displacement therein;

a gas spring, one end of which is elastically supported in said pedestal foot, the other end supporting said column, said gas spring acting to equalize the weight of said drawing table, said gas spring generally comprising a piston and a cylinder, one of which is stationary with respect to said pedestal foot;

a fixing brake coupled between said pedestal and said column to secure said column in arbitrary longitudinal positions; and

a fall safety device to prevent unintentional downward motion of said column when the equilibrium of said column is disturbed, said fall safety device being completely independent of said fixing brake and comprising:

a lever pivotably connected at one end to said column;

a tension spring;

adjustment means coupling the other end of said lever to one end of said tension spring, the other end of said spring being connected to said column to thereby bias said other end of said lever downwardly, said lever being engaged by said gas spring intermediate its ends; and

clamping means coupled between said lever and said one end of said gas spring to prevent unintentional downward movement of said column with respect to said pedestal.

4,111,390

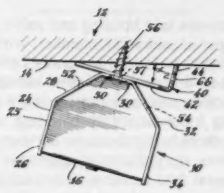
APPARATUS ORIENTATING ARRANGEMENT

Herbert N. St. Jean, New Milford, Conn., assignor to Arrowhead Enterprises, Inc., New Milford, Conn.

Filed Mar. 2, 1977, Ser. No. 773,707

Int. Cl.[2] E06B *9/17*

U.S. Cl. 248—274 **12 Claims**



1. In an apparatus adapted to transmit, receive or relay electromagnetic or acoustical energy along a fixed direction relative to said apparatus, an improved means for orientating the apparatus to selectively vary said fixed direction with respect to another apparatus, an object or a space comprising:

A. a housing for the apparatus;

B. said housing having an elongated surface adapted to be positioned adjacent a support body surface, said housing surface having a peripheral configuration defining a plurality of contiguous non-perpendicular planar segments independently mountable on said support body surface for providing a first plurality of alternative orientations of said fixed direction with respect to another apparatus or object or space;

C. housing positioning means adapted to be located between and in contact with a selected one of said housing segments and said support body surface to provide a second plurality of alternative orientations of said fixed direction; and

D. means for mounting said housing and said housing positioning means to said support body.

4,111,391

PINCH VALVE

Joseph J. Pilolla, Elmhurst, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Nov. 22, 1976, Ser. No. 743,701

Int. Cl.[2] F16K *7/07*

U.S. Cl. 251—5 **2 Claims**

1. A pinch valve including a housing, a generally cylindrical valve member formed of a flexible distortable rubber-like material attached to and positioned in said housing, said valve member having a plurality of equally spaced, axially extending grooves on the interior surface thereof, said valve member

having a plurality of equally spaced axially extending projections on the interior surface thereof, a plurality of equally spaced, axially extending grooves on the exterior of said valve member in peripheral register with said projections, the exterior of said valve member in peripheral register with said interior surface grooves being continuous and unchanged relative to adjacent portions thereof, said projections on the interior surface extending for a portion of the length of said flexible valve member, said grooves on the interior surface extending for a longer portion of the length of said flexible valve member than said interior projections, the application of

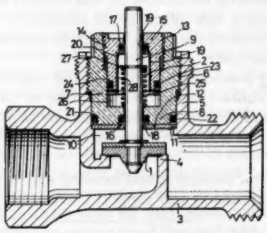
fluid pressure between said housing and valve member causing the inward collapse of said valve member, with the projections meeting in the center to form a generally complete closure of said valve member, and with the valve member folding upon said interior grooves, said housing having a plurality of outwardly extending lobes smoothly blending with the interior housing surface, there being the same number of lobes as there are interior grooves, the collapse of said valve member causing the outer peripheral fold surfaces to extend into said housing lobes, with the outer peripheral fold surfaces, when so collapsed, circumscribing a circle having a radius greater than that of said valve member in the uncollapsed condition.

4,111,392

VALVE, ESPECIALLY A RADIATOR VALVE

Günther Edelmann, Elztal-Auerbach, Fed. Rep. of Germany, assignor to Braukmann Armaturen AG, Rothrist, Switzerland

Filed Jul. 6, 1976, Ser. No. 702,771
Int. Cl.[2] F16K *31/44*
U.S. Cl. 251—214 **3 Claims**



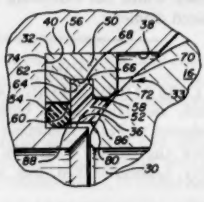
1. A valve structure having a housing, an inlet and outlet to said housing, a valve seat in said housing between said inlet and said outlet, a cup-shaped member within said housing, a valve stem extending from said housing, said valve stem having a valve plate engageable with said valve seat, fixed seal means between said valve stem and said cup-shaped member to prevent fluid escaping from said housing, a spring on said valve stem removed from said valve seat with respect to said fixed seal means, said spring lifting said valve plate from said valve seat, a threaded member in said cup-shaped member above said fixed seal means, surrounding said spring, with the upper end of said spring engageable with said valve stem, said threaded member being adjustable by the turning to control the lift of said spring, movable seal means carried by said threaded member to prevent fluid escaping from said housing on failure of said fixed seal means and means containing said movable seal means on said threaded member in fixed relation thereto whilst movable in relation to said valve stem on said adjustment of said threaded member.

4,111,393

BALL VALVE SEAT ASSEMBLY HAVING A REMOVABLY MOUNTED FACE SEAL INSERT

William E. McClurg, Stafford, and Charles C. Partridge, Houston, both of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Jul. 20, 1977, Ser. No. 817,391
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—174 **8 Claims**



1. A ball valve comprising:

(a) a valve body having inlet and outlet flow passageways connected by a valve chamber, a ball valve member mounted in said valve chamber for rotation between open and closed positions relative to said passageway;

(b) a seat pocket in said valve body around each of said passageways defined by substantially parallel inner and outer sides which are joined by an end wall that generally faces said ball valve member;

(c) a seat ring in said pocket having an outer periphery adjacent the outer side of the pocket and an inner periphery defined by first and second generally parallel inner peripheral surfaces facing the inner side of said pocket, said first and second peripheral surfaces being spaced from each other longitudinally relative to the flow passageway and defining therebetween an annular groove which opens toward the longitudinal axis of the passageways, said groove being defined by generally parallel opposed sides joining said first and second peripheral sufaces and extending generally transverse to the longitudinal axis of the passageways;

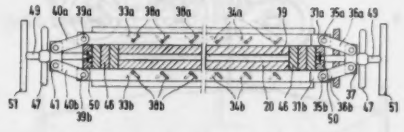
(d) a resilient seat ring insert mounted inside the seat ring extending over said second inner peripheral surface and including a face portion in sealing contact with said ball valve member and an outer peripheral retaining flange received within said groove, said insert being sufficiently deformable during assembly of the ball valve to permit a radially inward deformation thereof to displace said flange through the interior of said seat ring in order to engage said flange in said groove; and

(e) means within said seat pocket to bias said seat ring toward said ball valve member.

4,111,394
ADJUSTING DEVICE FOR THE GLAND PACKING OF A FLAT SLIDE-VALVE

Andreas Jaudt, Schongauerstrasse 10 c, D-8900 Augsburg, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,736
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2707036
Int. Cl.[2] F16K *31/44*
U.S. Cl. 251—214 10 Claims



1. In a valve of the type comprising a valve housing having means defining an aperture to be controlled, a flat slide valve within said housing mounted for movement toward and away from said aperture to selectively open and close said aperture, a gland packing within said housing, said packing being of elongated flat-surfaced substantially rectangular configuration and having one of its elongated flat surfaces in engagement with one side of said flat slide valve, and adjustment means for controlling the engagement pressure between said packing and said slide valve, the improvement wherein said adjustment means comprises at least one elongated flat-sided lamination mounted with a flat side thereof disposed adjacent and substantially parallel to a second flat surface of said packing opposite to said one flat surface and remote from said slide valve, said elongated lamination including a plurality of slots therein extending parallel to one another and at an inclination to the direction of elongation of said lamination, a plurality of fixed axles extending through said plurality of slots respectively in direction transverse to the direction of elongation of said lamination, and control means operable from the exterior of said valve housing for moving said elongated lamination in the direction of its elongation whereby the coaction between said slots and said axles simultaneously causes said elongated lamination to move within said housing in a direction transverse to its direction of elongation toward said gland packing.

4,111,395
BUTTERFLY VALVE

William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Continuation of Ser. No. 490,232, Jul. 22, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,132
Int. Cl.[2] F16K *1/22*
U.S. Cl. 251—306 14 Claims

1. A fluid valve comprising:

a body having a longitudinally extending passageway, said body being formed of first and second body members each having a passage aligned with the passage of the other to form said passageway;

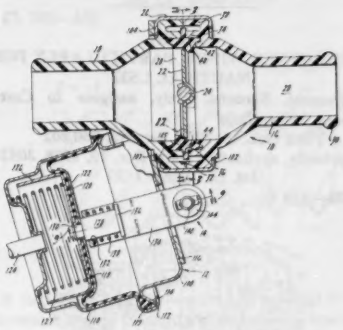
an elastomeric member sealingly disposed between said body members and defining an opening through which passes all the fluid flowing through said passageway;

a valve element disposed in said passageway for movement to and from a closed position in which said valve element sealingly engages said elastomeric member to block the flow of fluid through said opening;

actuating means for moving said valve element to and from said closed position; means defining inner and outer annular flange means on each of said first and second body members;

said outer flange means of said first body member engaging said outer flange means on said second body member to locate said body members with respect to one another,

said respective inner flange means of said first and second body members being spaced from one another a substantially uniform distance when said body members are assembled with said outer flange means in engagement; and

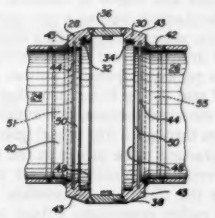


flange means integral within said elastomeric member being disposed between said respective inner flange means.

4,111,396
FABRICATED GATE VALVE STRUCTURE

Willard E. Kemp, and Bert L. Morrison, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 623,236, Oct. 17, 1975, abandoned. This application Apr. 8, 1977, Ser. No. 785,802
Int. Cl.[2] F16K *3/02*
U.S. Cl. 251—328 5 Claims



1. A fabricated gate valve structure, comprising:

(a) a hollow valve body having a bonnet;

(b) an inlet conduit and an outlet conduit mounted in opposed relation on said valve body and extending into a mid-portion thereof;

(c) a seat support means mouned with said inlet conduit and said outlet conduit having a pair of adjacent and spaced apart support members, each seat support member having an annular seat pocket on the gate side thereof to receive and mount a gate valve seat therin;

(d) said seat support members each having an annular groove in a spaced relation to an inner end portion of the associated seat pocket to define on one side of the groove an inner annular seat supporting lip which is capable of flexing and to define on the other side of the groove an outer conduit supporting cantilever beam which is capable of flexing and has an associated conduit welded thereto on the side thereof opposite the annular seat pocket whereby flexing of the outer cantilever beam may occur relative to the seat supporting lip to minimize any flexing of the seat supporting lip, said groove opening to the flow passageway of said gate valve structure and the

associated seat supporting lip being behind the inner end of the associated valve seat to contact said valve seat inner end and support said valve seat; and

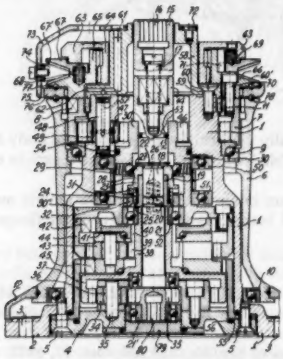
(e) a gate mounted between the seat support members for movement between open and closed position.

4,111,397

THREE-SPEED WINCH PARTICULARLY FOR NAUTICAL USE

Luciano Bonassi, Saronno, Italy, assignor to Costruzioni Barbarossa, Milan, Italy

Filed Dec. 15, 1976, Ser. No. 750,802
Claims priority, application Italy, Dec. 19, 1975, 30528 A/75
Int. Cl.[2] B66D *1/30*
U.S. Cl. 254—150 R **7 Claims**



1. A three-speed winch provided with a pulley the groove of which is adjustable in width so as to receive ropes of different diameters, said winch having a drum around which a sheet or rope can be wound and which is rotatable by means of the operation of a hand-crank having a pin portion which is inserted axially in the winch, comprising a fixed recessed casing encircled by said drum, one end of said casing being provided with fixing means projected from the bottom of said casing and the other end of said casing being provided with a rotatable annular member mounted thereon, said annular member meshing with the drum through a free wheel gear and said annular member being arranged to be driven in the same direction of rotation by differently combinable gears contained in said casing whatever the direction of rotation of the operating hand-crank, said pulley comprising a fixed support connected to the casing and having a cylindrical body portion coaxial with a driving shaft of the winch, a rotatable ring nut surrounding the cylindrical body portion carrying a movable flange of the pulley and engaged with a fixed flange of the pulley, said fixed flange of the pulley being connected with said annular member of the winch and provided with a hub internally screw-threaded and receiving in screw-threaded relation said ring nut carrying said movable flange, and resilient means for urging the movable flange away from the fixed flange.

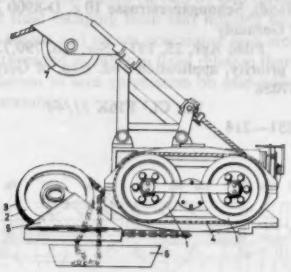
4,111,398

HAULAGE WINCHES

William Alexander, Elstree, and John T. H. Webb, Sunningdale, both of England, assignors to Wharton Engineers (Elstree) Limited, United Kingdom

Continuation of Ser. No. 569,394, Apr. 18, 1975, abandoned.
This application Jan. 11, 1977, Ser. No. 758,410
Int. Cl.[2] B66D *1/76*
U.S. Cl. 254—175.5 **9 Claims**

1. A multi-capstan winch for hauling in under load a cable, comprising at least first, second, and third rotatably driven capstans, the second and third capstans being of reduced diameters, the first capstan being of an enlarged diameter and driven for delivering the cable under load to the second and third capstans, the second and third capstans of a configuration to



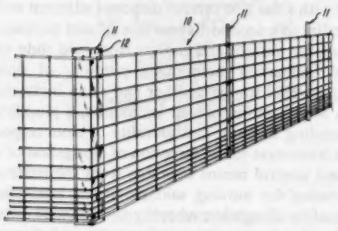
receive a plurality of wraps of the hauling cable, and the first capstan positioned with respect to the second and third capstan to receive more than a one-half wrap of the hauling cable.

4,111,399

PANEL FENCE

George G. Hutchison, III, Englewood, Colo., assignor to Hutchison-Western, Adams City, Colo.

Filed Apr. 13, 1977, Ser. No. 787,046
Int. Cl.[2] B21F *27/00*
U.S. Cl. 256—32 **6 Claims**



1. In a wire fence section having a plurality of horizontal strands and a plurality of vertical strands, said fence adapted for being coiled in a vertical cylinder, the improvement comprising in combination:

vertical strands of a selected gauge;

first and second horizontal strands welded to opposite ends of said vertical strands, said first and second horizontal strands having a common gauge heavier than said vertical strands;

a plurality of intermediate horizontal strands between said first and second horizontal strands reduced in gauge to have a common gauge lighter than said vertical strands, said intermediate horizontal strands and said vertical strands welded at respective points of intersection;

a rectangular array of openings defined by said first and second horizontal strands, said intermediate horizontal strands and said vertical strands wherein the vertical spacing between horizontal strands increases in the direction of reduction in the gauge of said horizontal strands from the lowest horizontal strand toward said intermediate horizontal strands; and

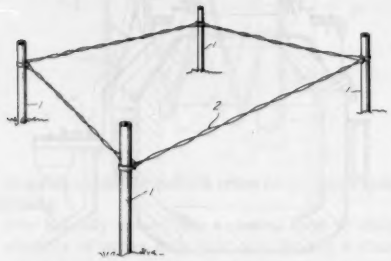
gauges of the horizontal strands being such as to allow the coilng of a 30 meter section of said fence about a tightly wound core of less than 50 cm diameter, said section when uncoiled not retaining substantial memory factor, and the gauge of said vertical strands being such that said vertical strands are substantially rigid for providing resistance against downwardly or upwardly directed collaps-

ing forces on said first and said horizontal strands and said intermediate horizontal strands.

4,111,400
ELECTRIFIED FENCE

Bertil Petrus Enoksson, Gyttorp, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Continuation-in-part of Ser. No. 680,790, Apr. 27, 1976, abandoned. This application Mar. 22, 1977, Ser. No. 780,000
Claims priority, application Sweden, Apr. 30, 1975, 7505043
Int. Cl.[2] A01K *3/00*
U.S. Cl. 256—47 **5 Claims**

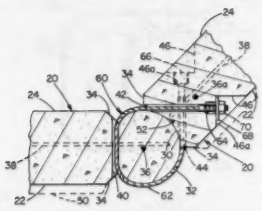


1. An electrified fence comprising: a plurality of carriers; at least one multi-layered ribbon; and fastening means for releasably fastening said ribbon to each of said carriers wherein said fastening means comprise an open loop of ribbon encompassing one of the carriers, and a ring made of elastically stretchable material slippable upon the two loop ends of the ribbon whereby upon tensioning said loop ends the resulting stretching of the ring anchors the loop in the ribbon to the respective carrier.

4,111,401
CONSTRUCTION ASSEMBLIES

William Hayden Pickett, 44 Lake Rd., Framingham, Mass. 01701

Filed Jul. 14, 1976, Ser. No. 705,350
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—13.1 **16 Claims**

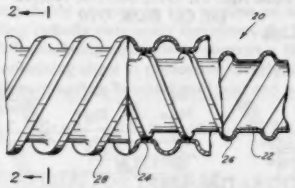


1. A structure comprising a series of preformed panels joined together at mating elongated male and female joint portions, the joint portions secured together by a series of discrete spaced apart flexible tension members looped about portions of each panel, wherein each tension member has two discrete terminations, the tension member passing from one of said terminations at a cooperating abutment face at a first side of a first panel, through a thickness of the panel, thence about the opposite side of the second panel, back through the thickness of the second panel, about its adjacent side, thence back through a thickness of the first panel to the second termination at a second abutment face at the first panel.

4,111,402
MOTIONLESS MIXER

Richard J. Barbini, Central Islip, N.Y., assignor to Chemineer, Inc., Dayton, Ohio

Filed Oct. 5, 1976, Ser. No. 729,725
Int. Cl.[2] B01J *13/10*
U.S. Cl. 366—338 **10 Claims**

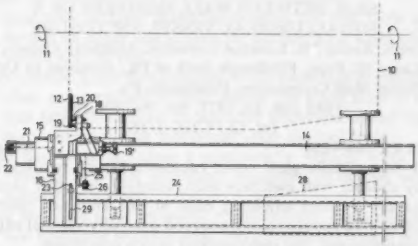


1. A motionless mixer for combining different substances put into communication therewith comprising; at least two tubular members, each tubular member having at least one spiral corrugated surface thereon, the members being arranged so that the longitudinal axes of adjacent tubular members either coincide or are parallel and the corrugated surfaces are stationary so that different substances brought into and out of communication therewith will be mixed together as the substances progress along the mixer in the direction of flow, adjacent said members touching each other at a predetermined number of points, and the spiral corrugated surfaces forming continuous contours to facilitate mixing of the substances.

4,111,403
APPARATUS FOR THE TREATMENT OF THE OUTER CONTOUR OF A WORM CONVEYOR

Peter Biegel, and Anton Dumont, both of Cologne, Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Aug. 30, 1976, Ser. No. 718,823
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1975, 2538734
Int. Cl.[2] B23K *7/10*
U.S. Cl. 266—58 **15 Claims**



1. Apparatus for cutting a desired edge contour of a worm which is to be used as a worm conveyor, comprising:
first means for rotating the worm about its longitudinal axis;
second means mounted for movement parallel to said longitudinal axis including a member for engaging the helix thrust surface of the rotating worm and be pushed along thereby to automatically move said second means along said worm;
a cutting torch movably mounted on said second means and directed toward said worm parallel to said longitudinal axis; and
third means for moving said cutting torch in the direction of said longitudinal axis, as said second means moves, in

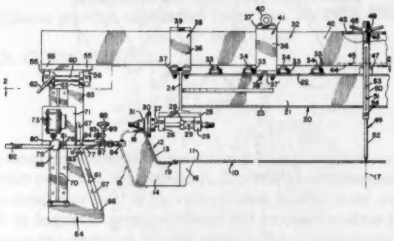
accordance with the desired edge contour to be formed on said worm.

4,111,404

FLAME CUTTING MACHINE FOR MODIFICATION OF RAILWAY CAR SIDE SILLS

John M. Benko, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 11, 1977, Ser. No. 786,753
Int. Cl.[2] B23K 7/10
U.S. Cl. 266—58 **9 Claims**



1. A flame cutting machine for trimming a plurality of longitudinally spaced laterally extending plate members in end-to-end alignment projecting outwardly from the sides of a railway car body comprising;

a support beam extending transversely of said car body;

guide means supported on said body and connected to said support beam for providing longitudinal movement of said beam relative to said body;

a second beam supported on said first beam for lateral movement with respect thereto;

means releasably locking said second beam to said first beam;

means for cutting said plate members;

means for supporting said cutting means on said second beam;

and means associated with the second beam for maintaining said second beam and cutting means centered with respect to said car body.

4,111,405

SEAL BETWEEN WALL MEMBERS OF A METALLURGICAL VESSEL ENCLOSURE

Peter S. Krelis, Mt. Lebanon Township, Allegheny County, and Larry M. Prox, Pittsburgh, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

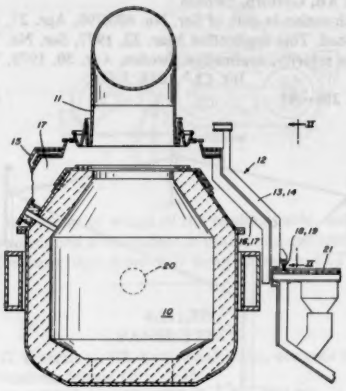
Filed Jun. 13, 1977, Ser. No. 806,218
Int. Cl.[2] C21C 5/38
U.S. Cl. 266—158 **3 Claims**

1. In a metallurgical vessel enclosure having two horizontally slidable wall members each, abutting the other along a generally vertical adjoining edge at one end, and abutting another wall member along a second generally vertical edge at an opposite end, the improvement which comprises:

a first elongated sealing member mounted along the exterior face of the edge of the first of the slidable wall members which adjoins the second slidable wall member, said first sealing member having a heat resistant compressible material with an exposed planar surface facing the second of said slidable wall members,

the compressible material of said first elongated sealing member being located so that its exposed planar surface is in a slightly retracted position from the edge of the first slidable wall member so as to be protected from heat and molten materials splashing from the vessel,

a second elongated sealing member mounted along the edge of the second slidable wall member adjoining the first, said second sealing member having a blade with a leading edge formed of a heat resistant material, said second elongated sealing member being located so that the leading edge of the blade substantially protrudes beyond the plane of the adjoining edge of the second slidable wall member toward the first elongated sealing member so as to make contact therewith before the adjoining edges of said first and second slidable wall members are brought into abutting contact, and



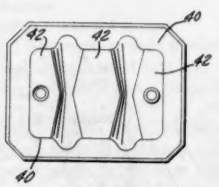
means for allowing the first of said elongated sealing members to move so that after the elongated sealing members are in contact, the two slidable wall members may be moved to an abutting position simultaneously displacing said first elongated sealing member further from the adjoining edges of the slidable wall members thus minimizing penetration of heat and splashing molten metal or slag to said sealing members.

4,111,406

CUSHIONING DEVICE

Andrey L. Zanow, Cleveland, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 12, 1976, Ser. No. 741,388
Int. Cl.[2] F16F 1/36
U.S. Cl. 267—153 **1 Claim**



1. A compression-type cushioning pad comprising a plate member having an elastomeric cushion bonded to a side of said member, said cushion having alernate ridges and valleys extending across the pad, each of said ridges being of maximum cross-sectional area at its midpoint and the opposing sides of said ridges diverging from their midpoint to the outer ends of the ridges, the opposing sides of said ridges being so contoured that upon the application of a predetermined compressive load to said pad, the opposing side of said ridges flow towards each other in such a manner that filling of said valleys occurs at the bottom thereof at point midway between the longitudinal ends thereof and said filling continuing until the opposing sides of said ridges come into contact at the midpoint thereof and under

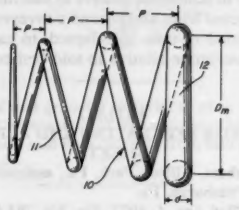
increasing compressive load engagement between said opposing sides progresses toward the ends of said ridges.

4,111,407

CONICAL COMPRESSION SPRING

Francis W. Stager, Stafford Springs, Conn., assignor to Litton Industrial Products, Inc., East Hartford, Conn.

Filed Sep. 30, 1976, Ser. No. 728,273
Int. Cl.[2] F16F *1/08*
U.S. Cl. 267—166 **3 Claims**



1. A spring exhibiting uniform stress and constant spring rate comprising:

a wire helically wound into a conical form to comprise a plurality of spring coils, said wire having a diameter *d* which diminishes from one end to the other, and each said coil having a mean diameter Dm which diminishes from one end of the form to the other,

the largest wire cross-sectional area comprising the base end of the spring, and

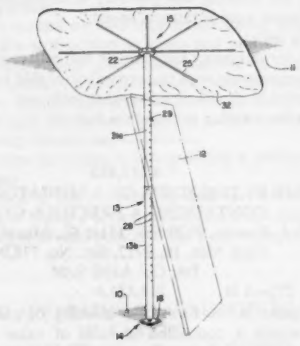
the pitch of the spring coils diminishing from one end of said form to the other, whereby the ratio Dm/*d* is the same from coil to coil throughout the form thereby to provide a spring wherein each coil has the same stress limit.

4,111,408

KNOCK-DOWN WORKPIECE-SUPPORTING STANDARD AND OVERSPRAY SHIELD

Francis Lee Love, 7010 Reynoldsburg-New Albany Rd., New Albany, Ohio 43054

Filed Aug. 26, 1977, Ser. No. 828,040
Int. Cl.[2] B25J *3/00*
U.S. Cl. 269—289 R **1 Claim**



1. A knock-down workpiece-supporting standard and overspray shield for paint-spraying operations, comprising:

(a) an elongated, generally vertically arranged post including a plurality of readily separable, longitudinally adjoining tubular sections formed at longitudinally spaced intervals with sets of peg-receiving openings;

(b) a workpiece-engaging standoff peg selectively positioned in a set of the peg-receiving openings of said post and operable to support a workpiece in relatively outwardly spaced relation to said post;

(c) a longitudinally extensible, floor-engaging foot adjustably carried at the lower end of said post; and

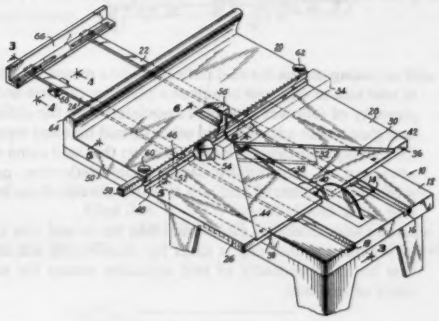
(d) a generally horizontally disposed, ceiling-engaging frame detachably carried at the upper end of said post and including a central, generally circular hub formed with a plurality of circumferentially spaced apart, radially disposed sockets and a plurality of elongated rods frictionally and detachably carried in the sockets of said hub and extending radially outwardly therefrom, the hub and rods of said frame being operable to support a flexible, overspray-collecting sheet in protective, overlying relation to the ceiling of a room in which said post and workpiece are positioned.

4,111,409

UNIVERSAL JIG FOR TABLE ROTARY CUTTING TOOLS

Willis A. Smith, Pleasantville, N.Y., assignor to Russell W. Wasylchak, Red Hook, N.Y., a part interest

Filed May 6, 1977, Ser. No. 794,533
Int. Cl.[2] B23Q *1/04*
U.S. Cl. 269—304 **22 Claims**



1. A jig for holding and feeding work to a table rotary cutting tool of the type having parallel guide slots in the table spaced on opposite sides of the cutter comprising

a base plate slidably positionable upon the tool table and having an upper flat surface for supporting a work piece which is to be cut,

two parallel guide bars attached to the underside of said base plate and arranged to slide within the guide slots of the tool table to maintain an accurate alignment of said base plate during sliding movement upon the tool table,

said base plate including a substantially vertical work advancing abutment extending upwardly from said work supporting surface,

and said base plate including a through-slot extending into said base plate from the edge thereof opposite to said work advancing abutment and having a center line parallel to said guide bars for providing clearance for the cutting tool as work is advanced into the cutting tool by sliding movement of said base plate.

4,111,410

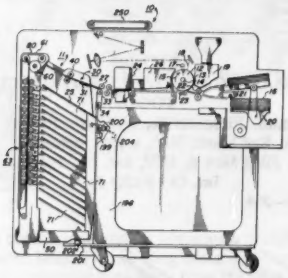
SORTING APPARATUS AND REPRODUCING MACHINE

Donald W. Tates, Fairport, and Stanley G. Clarkson, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1977, Ser. No. 783,358
Int. Cl.[2] B65H *39/10*
U.S. Cl. 271—173 **16 Claims**

1. In a sorting apparatus for collating the output of a reproducing machine, said apparatus comprising:

a plurality of sheet receiving bins arranged in a row;
means for transporting sheets past each of said bins; and
means for sequentially distributing said sheets into said bins, said sequential distributing means including; a plurality of deflection gate means each arranged adjacent one of said bins at an entrance opening thereof for deflecting a sheet from said transport means into said bin adjacent thereto, and means for sequentially actuating said deflection gate means for distributing said sheets in said bins; the improvement wherein:
said actuating means for said deflection gate means associated with a first and said bins in said row comprises a solenoid; and wherein,

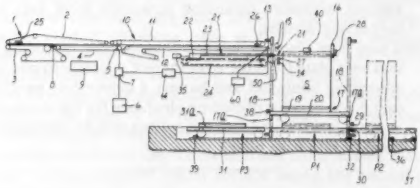


said actuating means for said deflection gate means of other of said bins in said row comprise a plurality of cams and a plurality of follower members associated with the deflection gate means adjacent said other of said bins and means for driving said cam in coordination so that said cams are advanced to sequentially actuate said deflection gate means of said other of said bins to distribute the sheets into said other of said bins;
whereby said deflection gate of said first bin in said row can be recycled to intercept a sheet for distribution into said first bin independently of said actuation means for said other of said bins.

4,111,411
SHEET STACKING APPARATUS

Bernard Albert Graves, and John Edward Mockett, both of Deptford, England, assignors to Masson Scott Thrissell Engineering Ltd., London, England

Filed Jun. 21, 1977, Ser. No. 808,945
Claims priority, application United Kingdom, Jun. 29, 1976, 27101/76
Int. Cl.[2] B65H *29/14, 29/60, 29/68, 31/32*
U.S. Cl. 271—199 **5 Claims**

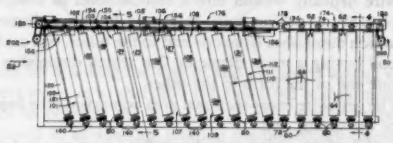


1. Sheet stacking apparatus comprising a stop member, a first conveyor arranged to carry a succession of sheets spaced apart in their direction of travel, a second conveyor arranged to receive sheets from said first conveyor and carry them to a delivery position horizontally spaced from said stop member by more than a sheet length and with sufficient velocity to travel into engagement with said stop member, means for driving said first and second conveyors so that said second conveyor travels at a slower speed than that of said first conveyor, and said sheets on transfer to said second conveyor are brought into overlapping relationship, a movable platform below the space between said second conveyor and said stop member and on to which sheets are fed in succession to form a stack containing a selected number of sheets, hoisting means for raising and lowering said platform, and further drive means adapted to be connected to and disconnected from said second conveyor, wherein said drive means is operable to decelerate said first and second conveyors in unison, said further drive means is arranged to be connected for a predetermined period of time to said second conveyor after such deceleration to cause the latter to accelerate relative to said first conveyor, and to be disconnected from said second conveyor, after said predetermined period of time has elapsed, to cause said second conveyor to decelerate relative to said first conveyor.

4,111,412
CONVEYOR FOR SEPARATING AND ALIGNING GLASS SHEETS

William P. Cathers, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 4, 1977, Ser. No. 784,485
Int. Cl.[2] B26F *3/00*
U.S. Cl. 271—251 **3 Claims**



1. A conveying system for separating and aligning sheets as they move along a sheet movement path, comprising:
a superstructure;
a plurality of cylindrical conveying members having successive increasing diameter in the direction of sheet advance to insure increasing spaced distance between edges of adjacent sheets as the sheets advance along the sheet movement path;
means for rotatably mounting said conveying members in spaced relation to one another on said superstructure with their axial centers parallel to one another and at an oblique angle to the sheet movement path, said rotatably mounting means including means for changing the oblique angle;
means for rotating said plurality of conveying members at the same axial rotational speed;
endless belt;
means for mounting said endless belt adjacent a side of said superstructure with major surface of said belt normal and parallel to the sheet movement path; and
means for rotating said endless belt.

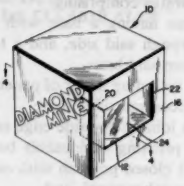
4,111,413
GAME IN THE FORM OF A MINIATURE MINE CONTAINING A PRECIOUS GEM

Emanuel J. Marcus, 8120 SW. 151st St., Miami, Fla. 33158

Filed Mar. 18, 1977, Ser. No. 778,962
Int. Cl.[2] A63F *9/06*
U.S. Cl. 272—1 R **6 Claims**

1. A game in the form of a quantity of granular material within which is concealed an item of value comprising: a hexagonal display container with side walls having means defining an aperture in at least one side wall thereof whereby interior contents may be viewed; a pair of opposed pillows blocks in said container at the top and bottom thereof, respectively, each of said pillow blocks having external lateral dimensions approximating the interior lateral dimensions of said container; a hexagonal box having side walls disposed between said pillow blocks, said box being configured similarly to said container but having smaller dimensions; at least one of said

box side walls being transparent to permit viewing of the interior thereof; and a quantity of granular material within said box, within which there is said single item of value, said single item of value being of a size and shape sufficiently similar to at



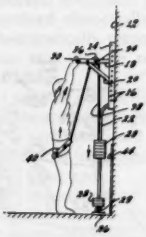
least a portion of said granular material so as to require careful examination and comparison of size and shape by a user of said game to distinguish said item of value from said portion of said granular material.

4,111,414

EXERCISING DEVICE FOR ASSISTING A PERSON TO PERFORM PULLUPS

Edward A. Roberts, 2205 Bahia Dr., La Jolla, Calif. 92037

Filed Oct. 12, 1976, Ser. No. 726,881
Int. Cl.[2] A63B *1/00*
U.S. Cl. 272—62 **6 Claims**



1. A pullup assist device for a person performing pullups comprising:
- a support structure for supporting the weight of said device and said person;
- a bar means carried by said support structure, adapted for use by a for said person to grasp and pull up against to perform said pullups while being assisted by the gravitational attraction of a counter weight, said bar means being selectively positioned vertically above the head of a person at a height dependent upon the height and reach of a person using the device;
- a flexible means for aiding in lifting during a pullup exercise person; and
- means attached to and cooperating with said flexible means for aiding in lifting a person cancelling a selected portion of the weight of said person when performing a pullups.

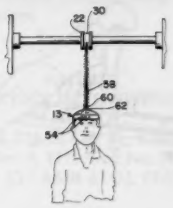
4,111,415

EXERCISING APPARATUS TO AID IN THE PRACTICE OF KARATE

Andrew Reitano, 2152 Ellis Ave., Bronx, N.Y. 10462

Filed Jan. 5, 1977, Ser. No. 756,873
Int. Cl.[2] A63B *21/12, 21/14, 21/16, 69/22*
U.S. Cl. 272—94 **1 Claim**

1. An exercising apparatus to aid in the practice of the martial arts which comprises an overhead horizontal support bar, said support bar being mounted between a pair of parallel opposing vertical support members, a wheel in turn rotatably mounted to said support bar between the opposing ends thereof, a first exercising component, a second exercising component, and a third exercising component, and means for removably connecting said first, second, and third exercising components with said wheel on said support bar, and wherein said first exercising component comprises a pair of straps whose upper ends each have a hook joined thereto, a pair of hooks in spaced circumferential relation being joined to the rim of said wheel, said hooks on said upper ends and on said rim



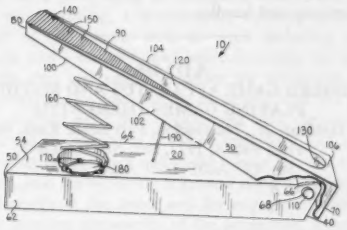
being in removably connectible association, each of said pair of straps having a lower end, one lower end being provided with a tensionable hand grip, the other lower end being provided with an adjustable foot grip, the spaced circumferential relation allowing for a pulley action when said straps are alternately raised and lowered by means of said hand and foot grips, respectively.

4,111,416

EXERCISER

Walter J. Jinotti, 10 Scott St., New Brunswick, N.J. 08902

Filed Jun. 6, 1977, Ser. No. 803,878
Int. Cl.[2] A63B *23/04*
U.S. Cl. 272—96 **14 Claims**

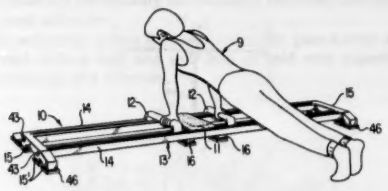


1. An exerciser comprising
- a first base member and a second upper member pivotally connected together, and
- a spring disposed between said members and normally holding them apart,
- said upper member being adapted to receive the foot of the user whereby the upper member can be pumped up and down to perform an exercise,
- said base member including means for coupling a mounting bracket thereto, said means comprising a plurality of parallel tubular members disposed parallel to each other and adapted to receive an operating portion of a mounting bracket, and
- a mounting bracket comprising a generally U-shaped member having side walls including means for engaging one of said tubular members for coupling the bracket thereto, and a rotatable arm for engaging others of said tubular members for disposing the bracket at an angle with respect to said base member, said bracket including locking means for clamping it to a support surface.

4,111,417
TORSO EXERCISER

James A. Gardner, 9200 H. N. Arch Village, Richmond, Va. 23235

Filed Feb. 14, 1977, Ser. No. 768,361
Int. Cl.[2] A63B *21/04*
U.S. Cl. 272—136 9 Claims

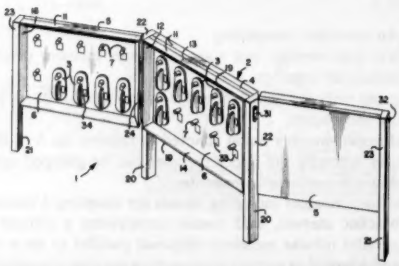


1. A torso exerciser for use by a person in the common push-up exercising position in the development of the upper torso comprising an elongated frame including a pair of transversely spaced parallel longitudinal members having opposite ends and support means for rigidly connecting said pair of longitudinal members and for supporting said longitudinal members above and parallel to a horizontal support surface, a pair of elongated handles, means for slidably mounting said handles to slide on said longitudinal members in parallel relationship to each other and with each handle transversely spaced above said longitudinal members, first resilient bias means supported by said longitudinal members between said handles for resiliently opposing sliding motion of said handles from a neutral spaced apart position toward each other, and additional resilient bias means supported by said longitudinal members on the opposite side of each of said handles from said first resilient bias means to resiliently oppose sliding motion of said handles from said neutral spaced apart position away from each other, a chest pad mounted in the mid section of said frame between said handles.

4,111,418
PEG BOARD GAME APPARATUS AND METHOD OF PLAYING GAMES THEREWITH

Hill D. DeMent, Jr., 742 Horton, Fort Scott, Kans. 66701

Filed Feb. 4, 1977, Ser. No. 765,828
Int. Cl.[2] A63F *3/00*; A63B *23/04*
U.S. Cl. 273—1 R 9 Claims



1. A method of playing a game by at least two players using a peg board having at least one peg projecting therefrom and at least one game piece having a peg receiving aperture and a gripping portion capable of being grasped between human toes, said method comprising the steps of:

(a) one player grasping said game piece by said gripping portion between the toes of one foot and moving said game piece from a first position off said peg;

(b) said player transferring said game piece to the toes of another player; and

(c) said other player moving said game piece to a second position with said peg projecting through said aperture.

5. A game apparatus comprising:

(a) a game piece having a base with a side, an aperture extending through said side, and a toe gripping portion projecting from said base;

(b) a peg board including a pair of panels, each panel having opposite surfaces and side edges;

(c) hinge means joining one side edge of each of said panels together for pivoting said panels between a fully open position and a closed position with one panel in covering relation to the other panel; and

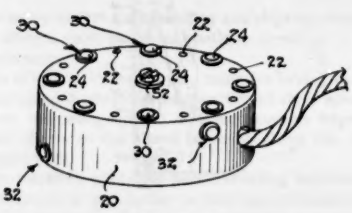
(d) a plurality of pegs on each of the surfaces of said panels which are facing when said panels are in said closed position, each of said pegs being receivable through said game piece aperture; and

(e) said pegs being of such length and relative position whereby the pegs on one panel abut corresponding pegs on the other panel when said panels are in said closed position.

4,111,419
PRACTICE HOCKEY PUCK

Peter P. Pellegrino, 2935 Border Links Rd., Visalia, Calif. 93277

Filed Jul. 26, 1976, Ser. No. 708,533
Int. Cl.[2] A63B *69/00, 59/14*
U.S. Cl. 273—1 B 8 Claims



5. A practice hockey puck comprising:

a body member having generally flat top and bottom surfaces joined by a cylindrical side surface generally in the form of a hockey puck, said member having a plurality of holes in said top and bottom surfaces adjacent the periphery thereof and in said cylindrical side surface for receiving and retaining a plurality of metal members, and further having holes centrally disposed through said top and bottom surfaces for receiving additional members;

a plurality of washers;

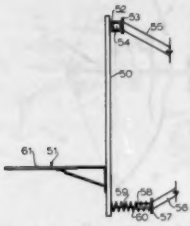
a plurality of metal members having a shank portion for fitting within a respective one of said holes in said top and bottom surface and said cylindrical surface, and a head portion of larger diameter than said shank portion, said shank portion of each of said metal members passing through at least one of said washers and into a respective one of said holes whereby said head portion of each of the respective metal members may engage a respective one of said washers to limit penetration of each of said metal members into said body member; and

top and bottom members of metal having a head portion and a shank portion, each of said top and bottom members of metal having its respective shank portion disposed in one of said centrally disposed holes in said top and bottom surfaces so that the head portion of said top and bottom members extend further away from said top and bottom surfaces of said body member, respectively, than said head portions of said plurality of metal members.

4,111,420
ENERGY ABSORBING BASKETBALL GOAL/BACKBOARD UNIT

Frederick Carlson Tyner, 2124 Hillock Dr., Raleigh, N.C. 27612

Filed Jul. 19, 1976, Ser. No. 706,836
Int. Cl.[2] A63B 63/04
U.S. Cl. 273—1.5 R 2 Claims



1. In a basketball goal/backboard unit of the type comprising a normally vertically positioned backboard having a flat frontal surface and a basketball goal structure mounted on said backboard frontal surface, said goal structure including a normally horizontally positioned annular ring and a mounting plate secured to and supporting said ring; the improvement comprising auxiliary means structurally associated with said backboard and goal structure and adapted to normally retain said ring horizontally positioned and enabling said ring to move out of said normal horizontal position under the influence of a predetermined abnormally-directed force applied thereto and to be automatically returned to said normal horizontal position once said force is removed therefrom, said auxiliary means including:

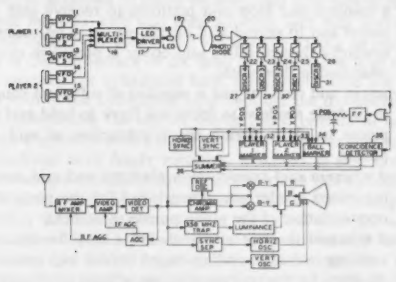
(a) upper pivotal support means mounted on the back surface of said backboard adjacent the top edge thereof and adapted to allow said backboard and said basketball goal structure to pivot as an integral structure when said force is applied to said goal; and

(b) lower resiliently loaded support means mounted adjacent the bottom edge of said backboard back surface, said lower support means providing energy absorbing means for receiving said force during movement of said ring from said normal position and for returning said backboard and basketball goal structure to their normal position once said force is removed.

4,111,421
OPTICAL LINKED REMOTE CONTROL VIDEO GAME APPARATUS

Eugene P. Mierzwinski, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Dec. 9, 1976, Ser. No. 749,147
Int. Cl.[2] A63F 7/06; F41J 5/08; G08B 5/22
U.S. Cl. 273—85 G 6 Claims

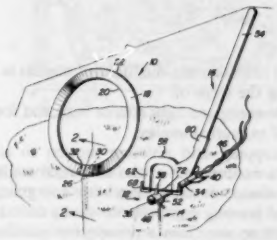


3. A remote controlled video game for generating a plurality of player positionable game markers on a CRT comprising means for selecting the positions of a plurality of game markers, means for generating a signal representing the selected positions of said game markers, a source of infrared light, means for modulating said source of infrared light with said signal, means for demodulating said modulated infrared light into a plurality of d.c. voltages, and a plurality of game marker generators for causing game markers to be displayed on a CRT display, said game markers' position being controlled by said plurality of d.c. voltages.

4,111,422
LAWN GAME DEVICE WITH SWUNG LAUNCHING STICK

Michael J. Burcenski, 318 E. 12th St., Lockport, Ill. 60441

Filed Dec. 9, 1976, Ser. No. 748,818
Int. Cl.[2] A63B 63/02, 67/00
U.S. Cl. 273—101 3 Claims



1. In a lawn game device, a missile comprising an elongated member having a nose at the forward end thereof and stabilizing vane means at the rear thereof, and a laterally and rearwardly inclined projection on said elongated member adjacent the nose adapted to be engaged by a launching device, a launching stick comprising an elongated handle for manual gripping and swinging, a downwardly opening arch at the lower end of said handle with the arch including parallel, spaced legs, and a resilient band interconnecting the terminal ends of the legs and engaging under the projection during arcuate swinging movement of the launching stick in a path to bring the resilient band into engagement with the projection for projecting the missile in a desired trajectory, and a cradle tee supporting the forward end of the missile above a supporting surface, said tee including a ground stake and a generally U-shaped cradle at the upper end for engagement with said elongated member rearwardly of the projection, a target for the missile comprising an annular member, a ground stake connected to said annular member for insertion into the ground to support the annular member in generally upright position, said annular member being frustoconical in configuration and oriented in inclined relation to a vertical plane so that the opening defining the center of the annular member has its periphery generally perpendicular to the path of trajectory of the missile as it approaches the target.

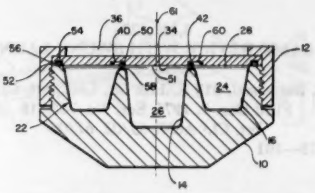
3. In a lawn game device, a launching stick for launching an inclined, stationary, ground supported projectile having an upwardly extending hook forming element thereon, said launching stick comprising an elongated handle for manual gripping and swinging in an arcuate path in a manner similar to a golf club or hockey stick, said handle having a downwardly opening laterally offset arch at the lower end of said handle, said arch having an open lower end adapted to straddle the projectile as the arch moves toward the hook forming element thereon, said arch including parallel, spaced legs, and having a resilient band interconnecting the terminal ends of said legs and engaging the hook forming element on the projectile for causing the projectile to be launched in an arcuate trajectory.

4,111,423

TRAP SHOOT SIMULATOR AND METHOD

Herbert F. DeWeese, 7650 E. Juanita Ave., Mesa, Ariz. 85208

Filed May 16, 1977, Ser. No. 797,529
Int. Cl.[2] F41J 9/00, 9/16
U.S. Cl. 273—101.1 **17 Claims**



1. A method of simulating the flight of objects in trap shooting, comprising the steps of:

pivoting a de-energized light source back and forth through a range of azimuthal angles;

randomly stopping said pivoting motion to set the light source at a random one of the azimuthal angles, and substantially simultaneously therewith energizing the light source and starting generally upward vertical movement of the light source from a preselected minimum vertical position along the random azimuthal angle;

de-energizing the light source as the latter reaches a preselected maximum vertical position;

restarting said pivoting back and forth motion;

driving the light source vertically downwardly to said preselected minimum vertical position; and

stopping vertical motion upon reaching said minimum vertical position.

6. A projector for simulating trap shooting, comprising:

a light source for projecting a beam of light simulating the flight of objects in trap shooting;

first drive means for moving said light source generally vertically up and down between preselected maximum and minimum vertical positions;

second drive means for moving said light source back and forth through a range of azimuthal angles; and

control means for controlling actuation of said first and second drive means and energization of the light source to randomly stop back and forth movement of said second drive means and to substantially simultaneously therewith start said first drive means for initiate upward vertical movement of said light source from said minimum vertical position along a random one of the azimuthal angles and energize said light source whereby said light source projects an upwardly moving beam of light along said random azimuthal angle, said control means also being for selectively stopping vertical movement when said light source returns to said minimum vertical position.

4,111,424

ARROW AND ARROW ATTACHMENT

Ronald E. Schreiber, 1195 Buff Way, Eugene, Oreg. 97401, and La Mon D. Christensen, 5511 Barger Dr., Eugene, Oreg. 97402

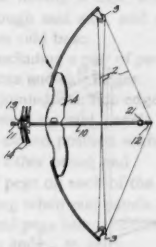
Filed May 9, 1977, Ser. No. 795,391
Int. Cl.[2] F41B 5/02
U.S. Cl. 273—106.5 C **1 Claim**

1. An arrow for short range use, said arrow comprising,

a shaft having fletching secured thereto adjacent the shaft rearward end,

a stop in place on said shaft forward of said fletching,

an attachment including a base slidably disposed on said shaft and positionable thereon from a front to a rear position against said stop during initial travel of the arrow, and



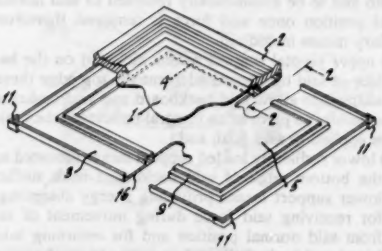
said attachment having outwardly projecting aerodynamic means acted upon by the slipstream to impart drag to the arrow to inhibit arrow flight.

4,111,425

JIGSAW PUZZLE HOLDER AND DISPLAY APPARATUS

George Edward Lathrop, Bricktown, N.J., assignor to The Lathrop Corporation of America, Clinton, N.J.

Filed Dec. 29, 1976, Ser. No. 755,130
Int. Cl.[2] A63F 9/00
U.S. Cl. 273—157 R **8 Claims**



1. Jigsaw puzzle apparatus comprising:

a work area for the assembly of component puzzle pieces, said work area being configured and arranged so as to hold a completed puzzle substantially in place; and

a cover overlying said work area in a manner to impart a compressive force upon said puzzle pieces in further holding said completed puzzle in substantially aligned relationship;

wherein said work area includes a construction platform, a raised border surrounding said construction platform, and a resilient pad atop said platform to receive said puzzle pieces and to permit said puzzle pieces to be compressed inwardly thereof when said cover is placed in overlying relationship therewith;

wherein said resilient pad is selected of sufficient roughness to provide a sideways frictional force to hold said puzzle pieces in place during the construction of said jigsaw puzzle;

and wherein said construction platform and said surrounding raised border are dimensioned for the particular accommodation of the given puzzle to be held;

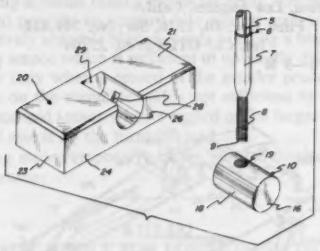
and wherein there is also included a tray fixedly circumscribing said surrounding raised border and construction platform for the containment, assortment and organization of individual puzzle pieces during the construction of said jigsaw puzzle.

4,111,426

GOLF CLUB SWING TRAINING DEVICE

Elwood Goodwin, 1245 Brittany Cir., Colorado Springs, Colo. 80907

Filed Apr. 11, 1977, Ser. No. 786,599
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 C 1 Claim



1. In a putter training device providing the combination of a channel-shaped guide member and putter arranged to move in a putter stroke in the guide member, the improvement of:

(a) the channel-shaped guide member having a flat bottom plate with flat top surface and flat bottom surface with parallel ends and parallel side edges, a fixed side rail depending normally to the top flat surface of the bottom plate at one edge of the member with its outer surface coinciding with said one edge and having an inner planar surface normal to the flat top surface and having a notch extending along the inner surface at its lower inside corner facing the top surface of the bottom plate and a movable side rail depending from the flat top surface of the bottom plate on the opposite edge of the bottom plate and movable toward and away from the fixed side rail, said movable side rail having an inner planar surface normal to said bottom plate and having a notch extending along its lower inside corner facing the top surface of said bottom plate; and a pair of spaced bores through said movable side rail from its top through its bottom, and a pair of slots in said bottom plate in mating communication with said pair of bores through the movable side rail, said slots extending longitudinally toward and away from said fixed side rail and being countersunk on the bottom surface of said bottom plate to support a screw head therein out of the plane of the bottom surface of the bottom plate; and a pair of screws extending through said slots and said movable side rail and beyond the top of said movable side rail with a wing nut mounted on each screw permitting adjustment of the movable side wall from its top surface; and an artificial surface, simulating grass secured to the top surface of said bottom plate, extending into both said notches in the side rail, whereby at maximum width adjustment said artificial surface extends into said notch in said movable side rail;

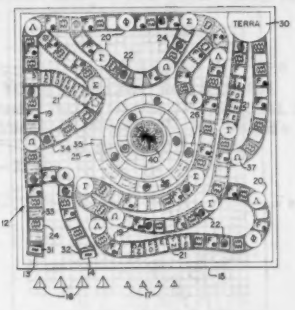
(b) a putter element with a parallelepiped head and a shaft, said head having parallel ends and parallel top and bottom surfaces arranged to move between said side rails of said guide member with said ends adjacent said rails, a truncated cylindrical bore in the top durface having an opening in the top surface of the head of a width less than the diameter of the cylindrical bore, a relatively deep slot in the wall of the cylindrical bore opposite the top opening accommodating the end of the threaded portion of said shaft, a cylinder with a slightly smaller diameter than said cylindrical bore freely rotatably mounted in said bore, therebeing a threaded bore passing through said cylinder, said putter shaft having a threaded lower end having a portion extending through said threaded bore in said cylinder with said extending end disposed in said slot, whereby said shaft is angularly adjustable to said head by turning to loosen the cylinder and permit pivoting of the shaft and to tighten the shaft to the head by reverse turning the shaft to frictionally wedge said cylinder in said head while the user of the putter is in putting stance with the putter head in the guide member.

4,111,427

SPACE TRAVEL GAME

Nelson Patterson, 1385 Ashland Ave., Des Plaines, Ill. 60016

Filed May 31, 1977, Ser. No. 801,762
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—250 4 Claims



1. A space travel game wherein the winner is determined by a player arriving at an end point with the greatest number of game pieces, said game comprising a game board having a main path, a first playing portion, said main path being on said first playing portion, a plurality of auxiliary paths selectively connected to spaced points on said main path, said main path and auxiliary paths comprising a plurality of serially positioned blocks, each of said blocks having indicia thereon as instructions to a player, said blocks being grouped into alternating series, a first series being of a first color and a second series being of a second color, a spinner assembly having pie-shaped wedges radially disposed about the center of said spinner assembly, said wedges alternating between said first color and said second color whereby movement along said path is controlled by said spinner assembly, numbers associated with each of said wedges, said spinner assembly including a pointer, said pointer disposed for random movement to a position within one of said wedges, thereby indicating the number associated with that wedge as the number of spaces to be moved by the game pieces of each player during his turn, the color of said wedge indicating the direction of travel of said playing piece when said playing piece approaches one of said spaced points on said main path, a second playing portion, said second playing portion being reached by a player's game piece when said game piece falls on certain of said blocks, said game piece returning to said first playing portion when falling on one of said blocks in said second playing portion, whereby a player may gain or lose game pieces when landing on a particular block and following said instructions given thereon.

4,111,428

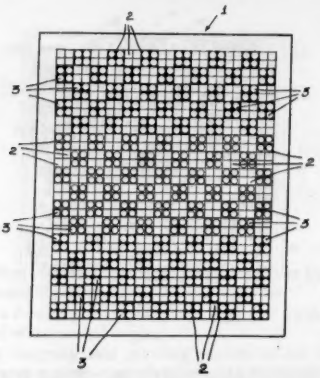
GAME OF NAVAL STRATEGY AND CHANCE

Ely Rubens Barbosa, Av. Itacira, No. 2106, Sao Paulo, Brazil

Filed Jul. 20, 1976, Ser. No. 707,030
Claims priority, application Brazil, Jan. 13, 1976, 00180
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—262 2 Claims

1. In a game of strategy and chance, a board having a major surface for playing thereon and divided into squares each subdivided into four smaller squares, a plurality of playing pieces of seven different configurations, said pieces including several of each configuration, other playing pieces representative of fixed targets comprising capitals of opponent players,

and petroleum bases of opponents positionable on said board playing surface in a given zone, the playing pieces of each configuration being representative of a movable weapons system that are targets for an opponent player able to cause removal of another target when within a firing range of said another target on said board, a plurality of monetary elements representative of different monetary values for buying said weapons systems and for payment of extent of movement of corresponding ones of said moveable weapons systems, a die for throwing thereof to ascertain the distance the weapons



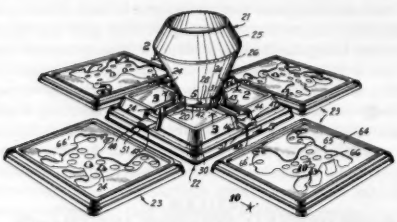
systems fire upon the throwing of the die, the result of each die throw denoting the range of the firing of said weapons systems, each weapons system having an effective range of firing and that range being a predetermined distance, and when the result on the die thrown corresponds with or is proportional to the number of smaller squares between a weapons system and a target being fired upon said target thereby being removable from said board and a plurality of cards having instructions thereon corresponding to acts to be carried out, punishments and chances.

4,111,429

GAME APPARATUS

Jane Waski, New York, N.Y., assignor to Janys Designs Limited, New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,689
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—271 **9 Claims**



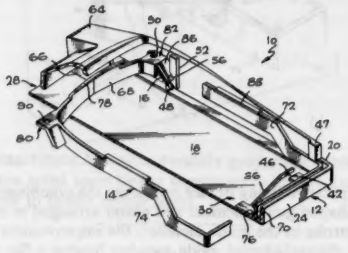
1. Game apparatus comprising a hopper, said hopper including a base defining a trough, a plurality of game pieces positioned within said hopper, said gamepieces being divided into at least two groups of separately identifiable gamepieces at least two distinct means associated with said hopper for removing said gamepieces therefrom upon actuation thereof, said gamepiece removal means including means for delivering said gamepieces to said trough after removal from said hopper and at least two distinct game boards having means for receiving said gamepieces placed thereon, each said gameboard including means for correlating said gameboard with one of said separately identifiable groups of gamepieces.

4,111,430

HAND HELD RECORD PLAYER WITH RECORD HOLDING ATTACHMENT

Reynold B. Johnson, Palo Alto, Calif., assignor to Microsonics Corporation, Los Angeles, Calif.

Filed Dec. 10, 1976, Ser. No. 749,432
Int. Cl.[2] G11B *3/40, 25/04*
U.S. Cl. 274—9 B **16 Claims**



1. A record holding apparatus comprising:

a card holding assembly, comprising a frame adapted for mounting to a hand-held record player, said record player having at least one indexing pin;

said frame having means at one end for receiving a record holding member having a record with means for centering said record in cooperation with the indexing pin of said record player;

said frame further having means for guiding said record holding member whereby said record holding member is movable relative said frame in substantially one direction in a plane perpendicular to the longitudinal axis of said indexing pin; and

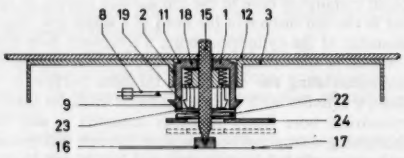
record holding member biasing means for biasing said record holding member in a direction parallel to the plane of said record holding member to a position wherein said indexing pin is centered on said record centering means said biasing means acting upon said record holding member during operation of the record player to maintain said record centering means centered.

4,111,431

RECORD PLAYER WITH RECORD DETERMINING MEANS

Poul Flemming Dalkov, Nivaa, Denmark, assignor to Skandinavisk Radio & Television Akts., Hasselager, Denmark

Filed Mar. 23, 1977, Ser. No. 780,455
Claims priority, application Denmark, Apr. 1, 1976, 1586/76
Int. Cl.[2] G11B *25/04*
U.S. Cl. 274—9 A **10 Claims**



1. In a record player having a turntable for individually supporting and rotating records of at least two different predetermined sizes, the combination comprising:

a vertically displaceable sensor centrally located with respect to the turntable;

sensor biasing means for maintaining said sensor in an upper position when no record is on the turntable, said sensor biasing means being of sufficiently low tension to allow said sensor means to be in a lower position when a record is on the turntable;

selectively actuable biasing means for being selectively actuated to provide an upward bias against said sensor, said selectively actuable biasing means exerting a biasing force on the sensor which is sufficient to upwardly displace said sensor only when a record of the smaller predetermined size is on the turntable and is not sufficient to upwardly displace said sensor when a record of the larger predetermined size is on the turntable and;

switching means responsive to the vertical displacement of said sensor.

4,111,432

AUTOMATIC DEVICE FOR POSITIONING THE TONE ARM OF A RECORD PLAYER

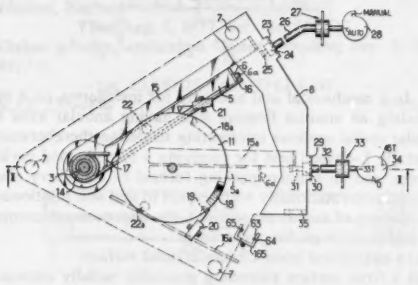
Jean Mazoyer, Nogent-sur-Marne, France, assignor to Beaulieu, Romorantin, France

Filed May 7, 1976, Ser. No. 684,372

Claims priority, application France, May 12, 1975, 75 14704

Int. Cl.[2] G11B *17/06*

U.S. Cl. 274—15 R **3 Claims**



1. In a device for positioning the tone arm of a record player having a turntable and a motor connected to drive said turntable,

said device comprising a second motor independent of the one driving said turntable, a tone arm, a rotatable shaft on which said tone arm is mounted, a vertically movable rod for lifting said tone arm, a first elongated member freely rotatable about said shaft, record diameter selecting means, retractable stop means controlled by said selecting means and adapted to stop said first elongated member in a selected position corresponding to the diameter of a particular record to be played, fixed stop means adapted to stop said first elongated member in a position corresponding to the diameter of the smallest record the player is adapted to accommodate, a second elongated member fixed to said tone arm shaft, spring means urging both elongated members together, and a photoelectric stopping device,

the improvement which comprises a cam wheel driven by said second motor and two switches in the supply line to said motor for stopping said motor with said cam wheel in either of two stopping positions, the first of which corresponds to the rest position of the tone arm, said cam wheel comprising:

a ramp on its upper part positioned to actuate said lifting rod to regulate the height of said tone arm,

a notch on its lateral surface cooperating with said two switches and,

a projection on its bottom positioned to drive said spring means and said first elongated member as said cam moves between said cam wheel stopping positions until said first elongated member encounters a selected one of said stop means, whereupon further rotation of said spring means relieves the pressure by said spring means urging said elongated members together,

said photoelectric stopping device being positioned to be energized by said second elongated member when said record has been played and cause said cam wheel to drive said spring until both elongated members are again urged together, whereupon said projection drives said first elongated member until the cam wheel reaches its first stop position.

4,111,433

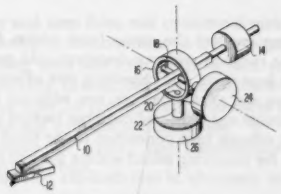
TONE ARM CONTROL SYSTEM

Herbert P. Raabe, 10121 Lloyd Rd., Potomac, Md. 20854

Filed Dec. 10, 1976, Ser. No. 749,566

Int. Cl.[2] G11B *3/10*

U.S. Cl. 274—23 R **13 Claims**



1. A tone arm control system comprising a tone arm, pick-up cartridge means mounted at one end of said tone arm, counterweight means mounted adjacent the opposite end of said tone arm, gimbal means supporting said tone arm intermediate said cartridge means and said counterweight means for rotation about horizontal and vertical axes and servo means for imparting rotation to said tone arm about each of said axes, said pick-up cartridge means having sensing means for sensing undesirable unidirectional and oscillatory forces in the vertical and horizontal directions and transducer means responsive to said forces for providing signals to circuit means for providing feedback control signals to said servo means feedback control signals to circuit means for controlling said servo means thereby to compensate for said undesirable unidirectional forces and oscillatory forces in the vertical and horizontal directions.

4,111,434

METHOD OF PRESSURE SEAL SIMULTANEOUSLY EMPLOYING AIR-BALANCE OF A HIGH PRESSURE STEAMER AND AN APPARATUS THEREFOR

Yoshikazu Sando; Hiroshi Ishidoshiro, and Matsuo Minakata, all of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Japan

Division of Ser. No. 583,836, Jun. 4, 1975, Pat. No. 4,017,258. This application Feb. 27, 1976, Ser. No. 662,233

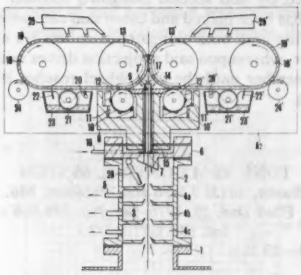
Claims priority, application Japan, Jun. 10, 1974, 49-65819; Jun. 10, 1974, 49-65820

Int. Cl.[2] F16J *15/40*

U.S. Cl. 277—3 **4 Claims**

1. A pressure seal apparatus employing air balance for a high pressure steamer comprising a roll seal mechanism forming one a fiber products take out and feed in opening, means forming an elongated air seal chamber opening at one end to said roll seal mechanism and arranged at the other end for connection to a high pressure steamer, the interior of said air seal chamber forming a duct-like passage for conveying the fiber products between the steamer and said roll seal mechanism, said means including dividing walls extending transversely of said duct-

like passage and spaced apart in the elongated direction of the passage for forming a plurality of serially arranged gas chambers with adjoining gas chambers being open to one another so that the fiber products can pass serially through the chambers in passing between the steamer and said roll seal mechanism, means for supplying a pressurized sealing gas into the end of said duct-like passage adjacent to said roll seal mechanism so



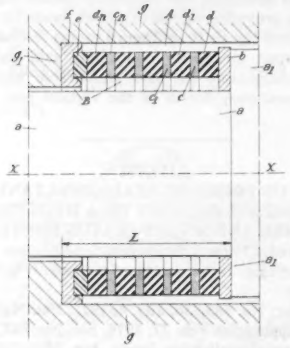
that the sealing gas and the steam from within the steamer intermix in the range of said gas chambers, said gas chambers comprising at least three said chambers, one adjacent said roll seal mechanism end of said passage, one adjacent the steamer end of said passage and third said chamber located between the other two, an exhaust tube connected to the third one of said gas chambers for removing mixed sealing gas and steam therefrom to a point exteriorly of said duct-like passage.

4,111,435

FLUID-TIGHT SEALING DEVICES

Robert Vilain, Maisons Alfort, France, assignor to Entreprise d'Equipements Mecaniques et Hydrauliques EMH, France

Continuation of Ser. No. 522,287, Nov. 8, 1974, abandoned. This application May 18, 1976, Ser. No. 687,646
Claims priority, application France, Nov. 14, 1973, 73 40456
Int. Cl.[2] F16J *15/02*
U.S. Cl. 277—9 **7 Claims**



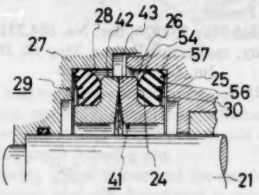
1. In a flexible sealing coupling arrangement for joining substantially axially aligned pipe sections comprising opposed end flanges provided at the adjacent ends of the pipe sections and a sealing assembly located between the end flanges, the sealing assembly comprising a stack of axially aligned and alternately disposed rigid and resilient rings, the improvement wherein said sealing assembly is resiliently compressible to an axial dimension which is slightly less than the distance by which said end flanges are spaced from one another in the operative positions thereof and wherein first and second end rings are disposed at the opposite ends of said stack and attached to said flanges of said pipe sections, said end rings having a substantially greater diameter than that of said stack, said resilient rings of said stack being mounted for compression between the rigid rings adjacent thereto and said end rings, respectively, means being provided subjecting said stack to a prestressing compression so as to impart to the assembly a said axial dimension slightly less than said distance between said end flanges and for releasing said prestressing compression when said assembly is disposed between said end flanges of the pipe sections so that, in use, said assembly is expanded against the end flanges of the pipe sections.

4,111,436

MECHANICAL SEAL

Hiroyuki Yazawa, Kawagoe, Japan, assignor to Nippon Oil Seal Industry Company, Ltd., Japan

Filed Jun. 29, 1976, Ser. No. 700,897
Claims priority, application Japan, Aug. 30, 1975, 50-105479
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—92 **11 Claims**



1. In a mechanical seal assembly for installation on a shaft including an annular floating seat having annular axial and annular radial sections intersecting to define therebetween a generally L-shaped seat for receiving a force-loaded packing therein, and an annular packing formed of a rubbery elastic material non-rotationally with respect to said seat positioned in the opening of said L-shaped seat, the improvement comprising said annular packing including:

(a) a cylindrical inner circumferential surface;

(b) a front surface extending generally radially outwardly from one end of said inner circumferential surface and generally aslant toward the other end of said inner circumferential surface;

(c) a back surface extending generally radially outwardly from said other end of said inner circumferential surface and generally aslant in generally the same direction as said front surface, said back surface including at least one annular groove slit therein; and

(d) a cylindrical outer circumferential surface connecting said back surface with said front surface; said packing disposed in said L-shaped seat with said inner circumferential surface in contact with the surface of said axial section within said L-shaped seat.

4,111,437

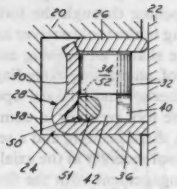
OIL CONTROL RING SPACER-EXPANDER WITH IMPROVED SLIP LATCH

Lee H. Saylor, Muskegon, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.

Filed Sep. 8, 1976, Ser. No. 720,275
Int. Cl.[2] F16J *9/06, 9/18*
U.S. Cl. 277—139 **5 Claims**

1. In combination with a circular spacer-expander for use in a piston oil control ring having a free-state radius of curvature and parted expander ends, and including a plurality of alternating concentric circumferentially spaced inner and outer crowns integrally interconnected by a plurality of generally diverging legs and oil drain openings formed one in each of said plurality of legs, an improved slip latch comprising a curved rod having a radius of curvature equal to or less than

said radius of curvature of said spacer-expander, said rod having one end extending through at least one leg opening adjacent one end of said spacer-expander and having means formed in said one end between adjacent spacer-expander legs to limit sliding of said latch in said spacer-expander, said rod further having a second end extending through a plurality of leg openings in the opposing spacer-expander end and being free to slide through said plurality of leg openings, said second rod end terminating in an inwardly directed beveled face to permit said second end to ride over opposing edges of said plurality of leg openings said rod having an inside radial edge which is substantially flat in radial cross section of said rod.



4,111,438

SEALING RING ASSEMBLIES FOR PISTONS

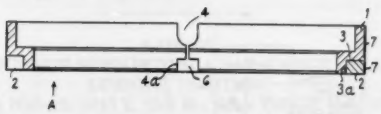
Gerald Longfoot, Lymington, England, assignor to Wellworthy Limited, England

Filed Aug. 1, 1977, Ser. No. 820,937

Claims priority, application United Kingdom, Sep. 2, 1976, 36492/76

Int. Cl.[2] **F02F** *5/00*; **F16J** *9/00*

U.S. Cl. 277—148 **6 Claims**



1. A sealing ring assembly for a piston comprising:

an outwardly springing carrier ring having a gap,

a recess disposed in the outer peripheral surface of the carrier ring,

an inwardly springing sealing ring having a gap,

the outwardly springing character of the carrier ring being stronger than the inwardly springing character of the sealing ring,

said inwardly springing sealing ring being located in the outer peripheral recess in said outwardly springing carrier ring and said gaps in the two rings being displaced one from the other.

4,111,439

ROTARY SEAL

John Kenneth Schmidt, Victorville, Calif., assignor to Amcord, Inc., Riverside, Calif.

Filed Jun. 6, 1977, Ser. No. 804,151

Int. Cl.[2] **F16J** *15/32*; **F27B** *7/24*

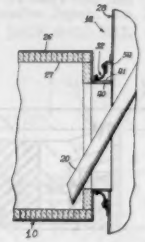
U.S. Cl. 277—153 **10 Claims**

1. A rotary seal for sealing a large, high temperature rotary drum from the inflow of ambient air where the drum is mounted for rotation in respect to at least one stationary hood, said drum having a substantially circularly cylindrical surface at one open end thereof substantially coaxial with the axis of rotation of said drum, and said hood having an opening through which said cylindrical surface extends, and said hood being open to the interior of said drum through said open end, said seal comprising

a strip of flexible material for encircling said cylindrical surface and having an inner edge and an outer edge, said flexible material being formed of cloth and substantially air impermeable and resistant to heat and oxidation at temperatures at least up to 250° F.,

means for sealing said outer edge to said hood around said opening,

a wear liner affixed to the underside of said inner edge for



spacing said strip from said cylindrical surface, said wear liner having an undersurface on a side opposite said strip for mating with said cylindrical surface, said wear liner being resistant to wear, heat and oxidation at temperatures resulting from the frictional engagement of said undersurface and said cylindrical surface, and

biasing means for biasing said undersurface against said cylindrical surface.

4,111,440

SEALING MEMBERS

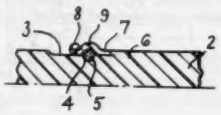
James Young, London, England, assignor to J. Young (Scientific Glassware) Ltd., England

Filed Jul. 11, 1977, Ser. No. 814,154

Claims priority, application United Kingdom, Jul. 23, 1976, 30903/76

Int. Cl.[2] **F16J** *9/06*

U.S. Cl. 277—165 **15 Claims**



1. A sealing member for association with a bore in a barrel member, said sealing member comprising:

(a) a support of circular cross-section made of a substantially chemically inert, tough, compressible material, and support defining an annular groove therein,

(b) a sealing ring made of an elastomeric material mounted in said annular groove in said support,

(c) a sheath which covers the ring and is sufficiently thin for the sealing ring to form a resilient annular bulge in the sheath,

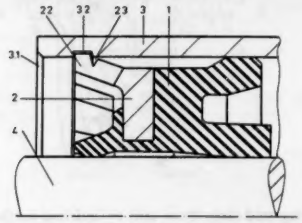
(d) said sheath being integral with the support on one side of the sealing ring, and

(e) said sheath having a compressed rolled portion on the other side of the sealing ring, whereby the sealing ring is sealed on both its sides by the sheath.

4,111,441
SELF-ARRESTING SEALING RING

Hans-Hermann Sick, Weinheim an der Bergstrasse, and Erich Habel, Fürth, both of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Germany

Filed Mar. 7, 1977, Ser. No. 775,352
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610584
Int. Cl.[2] F16J *15/18*
U.S. Cl. 277—183 8 Claims

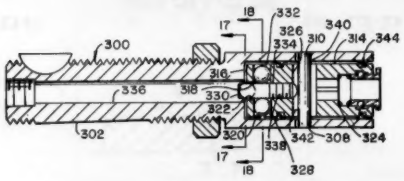


1. A self-arresting seal ring for machine parts moving relatively to one another, comprising an elastomeric part and a support part fixedly connected thereto, the sealing ring having an x-shaped cross-section, two limbs of of the elastomeric part lying on the same circumference and being constructed as dynamically acting sealing lips, a third limb of the elastomeric part being constructed as a statically acting sealing lip, and the fourth limb being formed from the support part and having a supporting edge projecting radially beyond the third limb and being resilient in such radial direction so as to be able to flex and lock into a suitable recess in one of the machine parts and means defining a predetermined breaking line on the support part adjacent to the supporting edge.

4,111,442
FLOATING TOOL HOLDER

Walter W. Wawrzyniak, 39230 Gary, Mt. Clemens, Mich. 48043

Filed Jul. 19, 1976, Ser. No. 706,933
Int. Cl.[2] B23B *31/16, 5/22, 5/34*
U.S. Cl. 279—16 21 Claims

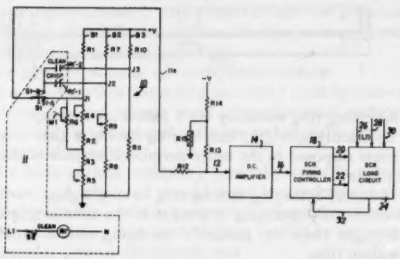


1. A floating tool holder comprising a shank including means on one end for securing the shank to a spindle or the like in an axially fixed position for rotation with the spindle, a recess in the other end of the shank, floating structure positioned within the recess in the other end of the shank having dimensions so as to be in spaced relation with the inside walls of the recess including a torque washer in the bottom of the recess and a tool receiver in the outer end of the recess, means for rotating the tool receiver on rotation of the shank including a first transversely extending slot in the bottom of the recess in the shank, a second slot in one side of the torque washer extending parallel to the first slot, a third slot in the other side of the torque washer extending substantially perpendicularly to the second slot and a fourth slot in the inner end of the tool receiver extending parallel to the third slot, each of said slots having a circular segment cross section and circular bearings positioned within the slots between the shank and torque washer and between the torque washer and tool receiver, means for securing the torque washer and tool receiver in predetermined axial positions within the recess in the shank comprising transverse openings extending through the shank across the recess therein, an opening extending through and transversely of the tool receiver and a first pin having a diameter less than the diameter of the opening through the tool receiver extending through the opening in the tool receiver and fixed at its ends in the openings in the shank, an opening extending through the shank axially thereof, an opening extending through the torque washer centrally thereof and an axial opening extending into the inner end of the tool receiver in communication with the transverse opening therethrough, and a second pin threadedly engaged with the tool receiver in the axial opening in the inner end thereof into engagement with the first pin and extending through the opening in the washer and into the axial opening in the shank, resilient O-ring structure positioned partially within the periphery of the tool receiver and extending between the tool receiver and the inner diameter of the recess for centering the floating structure and permitting relative translation and pivotal movement between the floating structure and tool holder shank and means for positively rotating the shank of the tool holder.

4,111,443
CONTROL SYSTEM FOR ENERGIZING ELECTRICAL RESISTANCE HEATERS IN COOKING FLUIDS

Neal Sullivan, Nashville, and George E. Cook, Franklin, both of Tenn., assignors to KFC Corporation, Louisville, Ky.

Continuation of Ser. No. 600,135, Jul. 30, 1975, abandoned. This application May 3, 1977, Ser. No. 793,401
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—497 6 Claims



1. A system for controlling excitation of an electrical resistance heater by a multiphase supply of electrical voltage to conform the temperature of a cooking fluid to first or second predetermined temperature-time characteristics, comprising:

(a) a signal generator means for generating first and second output signals having amplitude-time characteristics respectively indicative of temperature constant with passage of time and temperature decreasing with the passage of time;

(b) switch means for receiving said output signals and having a terminal, said switch means being settable to apply any selected one of said output signals to said terminal;

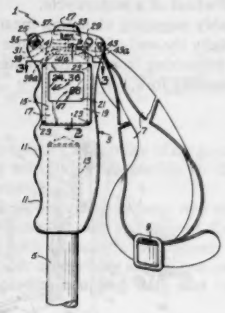
(c) temperature-sensitive means contained in said fluid for generating a control signal indicative of the temperature of said fluid; and

(d) circuit means connected to said switch means terminal and said temperature-sensitive means and responsive to both said selected output signal and said control signal for interconnecting said heater with said voltage supply during time extents proportionally related to the amplitudes of both said selected output signal and said control signal.

4,111,444
SKI POLE WITH TIMING DEVICE

Joseph A. Clements, Jr., 1217 Littlefield Ave., Northfield, N.J. 08225, assignor to Joseph A. Clements, Sr., Northfield, N.J.

Filed Sep. 29, 1977, Ser. No. 837,721
Int. Cl.[2] A63C *11/22*
U.S. Cl. 280—11.37 E 12 Claims

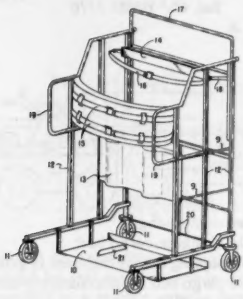


1. A ski pole comprising:
a. an elongate handle having
   1. a first free end, and
   2. a second end for attachment to a shaft;
b. a recess disposed inwardly of the first free end of the handle;
c. a timing means disposed within the recess and including a display face that is viewable along an axis perpendicular to the longitudinal axis of the handle; and
d. means carried adjacent the first free end of the handle for actuating the timing means.

4,111,445
DEVICE FOR SUPPORTING A PARAPLEGIC IN AN UPRIGHT POSITION

Kenneth Haibeck, 1413 E. Oak St., Sioux Falls, S. Dak. 57105

Filed Jun. 9, 1977, Ser. No. 805,135
Int. Cl.[2] B62D *53/06*
U.S. Cl. 280—79.3 3 Claims

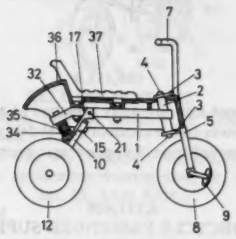


1. A device of the class described comprising platform means mounted for easy movement from one place to another, frame means erected from at least part of said platform, a pad mounted on said framework in position to engage the knees of a patient standing on said platform, strap means fastened to said framework and adapted to engage the back of said patient, a crossbar means on said frame means at a level above said strap means whereby the chest of the patient is supported, and grab bar means adjustably mounted at the front of said frame above said crossbar means whereby the patient by grasping and pulling on said grab bar means may assist in pulling himself erect.

4,111,446
TRICYCLE FOR CHILDREN

Kenzou Kassai, Higashishimizu, Japan, assignor to Kassai Kabushiki Kaisha, Higashishimizu, Japan

Filed May 2, 1977, Ser. No. 792,987
Claims priority, application Japan, Jun. 25, 1976, 51-75846
Int. Cl.[2] B62K *9/02*; B62J *1/02*
U.S. Cl. 280—275 1 Claim



1. A tricycle for children comprising:
a main frame comprising
   a main rod,
   handle rods attached to the front end of said main rod,
   a front wheel attached between the lower ends of said handle rods,
   a pair of rear legs pivotally connected to the back portion of said main rod, said rear legs comprising one continuous long bent rod,
   a pair of rear wheels connected to the back end of said main rod,
   a spring connected to the back end of said main rod;
a projection attached to the central bend of said long bent rod;
a fan-shaped plate fixed to the central bend of said long rod;
an attachment comprising
   a main rod attaching portion having a bottom plate and sides plates between which said main rod is inserted,
   an engaging plate attached to said main rod attaching portion which engages said projection,
   a rear attaching portion which is attached to said main rod attaching portion and inclined thereto, and is fixedly connected to said fan-shaped plate,
   a bolt and a nut which fixedly connect said fan-shaped plate and said rear leg attaching portion of said attachment, and
a spring attaching portion which is provided at the back of the said rear leg attaching portion so that said spring may be attached between the back end of said main rod and said spring attaching portion.

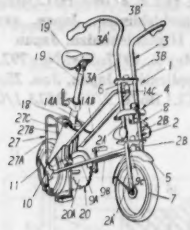
4,111,447
FOLDING BICYCLE

Hajime Ishida, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1977, Ser. No. 782,366
Int. Cl.[2] B62K *15/00*
U.S. Cl. 280—278 12 Claims

1. A folding bicycle comprising a rearwardly foldable front support assembly comprising pivotally interconnected upper and lower assembly sections, said upper assembly section having handlebars, said lower assembly section having fork blades to support a front wheel therebetween, a lower frame member pivotally attached at its front end to said lower assembly section and supported at its rear ends on a freewheel hub axle of a rear wheel, an upper frame member pivotally attached at its

front end to said upper assembly section and at its rear ends to the rear ends of said lower frame member or to said free-wheel hub axle for angular movement relative to said lower frame



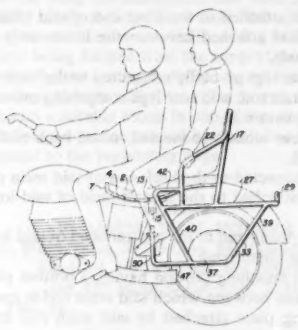
member, and a seat stay pivotally attached at a lower portion thereof to said lower frame member and slidably attached at an upper portion thereof to said upper frame member.

4,111,448

MOTORCYCLE PASSENGER SUPPORT

Paul George Sklodowsky, 108 Hillcrest Rd., Warren, N.J. 07060

Filed Oct. 18, 1976, Ser. No. 733,255
Int. Cl.[2] B62J *1/28*
U.S. Cl. 280—289 E **10 Claims**



1. A passenger support and protective device for use in connection with a motorcycle having a seat, said device comprising anchoring means for attachment to the frame of said motorcycle, an upper support structure attached to said anchoring means, said upper support structure including a backrest adapted to support a passenger seated in said seat, and a pair of protective upper side rails attached to said backrest for protecting at least the lower torso of said passenger, and a lower support structure for stabilizing said device, said lower support structure including a substantially U-shaped rigidifying member disposed substantially in the plane of said seat, and a pair of depending protective lower support rails attached to said rigidifying member for protecting the legs of said passenger.

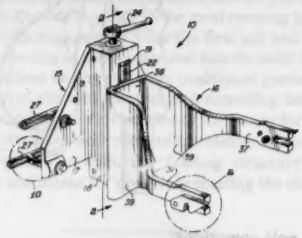
4,111,449

BUMPER HITCH FOR TOWING MOTORCYCLES

Charles Lee Hancock, 2545 E. Linda Cir., Phoenix, Ark. 85024

Filed Sep. 29, 1977, Ser. No. 837,698
Int. Cl.[2] B62D *53/04*
U.S. Cl. 280—402 **5 Claims**

1. A motorcycle bumper-mounted towing hitch comprising:
a hitch support portion for detachably mounting on the rear bumper of a towing vehicle,
a rearwardly extending tow-bar portion comprising a pair of tow-bars detachably securable in straddling relationship to the depending sides of a motorcycle steering fork,
said hitch support portion comprises an integral center post angularly positioned relative to the ground,
a first means for attaching said tow-bar portion to said center post for reciprocal movement longitudinally thereof,
said tow-bar portion further comprising a channel member adapted to detachably receive and hold a portion of a front wheel of a motorcycle,
detachably engaging clamping means one mounted at substantially the end of each tow-bar for engaging mounting pins projecting from the depending sides of the motorcycle steering fork,



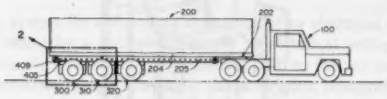
said clamping means comprising a pair of spring-actuated cam members pivotally mounted one adjacent the free end of each of said tow-bars,
each of said clamping means being provided with an open-ended slot for receiving the mounting pins,
said cam members being rotated by their springs about said pins after said pins enter said slots to hold the pins therein, and
a second means mounted on said center post for selectively actuating said tow-bar portion along said center post to raise and lower the front wheel of a motorcycle.

4,111,450

MULTIPLE HOOK-UP, MOVABLE AXLE TRAILER WITH REMOVABLE TRACK EXTENSIONS, SLIDABLE KINGPIN, AND PIVOTAL AXLE ASSEMBLIES

Robert R. Pinto, 2800 Federal St., Camden, N.J. 08105

Continuation-in-part of Ser. No. 788,182, Apr. 18, 1977. This application Jul. 22, 1977, Ser. No. 818,194
Int. Cl.[2] B60D *1/16*
U.S. Cl. 280—405 A **9 Claims**

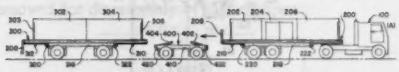


1. A cargo trailer comprising:
(a) a substantially elongate cargo bed;
(b) a plurality of coupling means disposed at generally opposite ends of said cargo bed for alternatively coupling to the fifth wheel of a vehicle;
(c) at least one axle means for supporting said bed;
(d) fixed track means associated with said bed spanning continuously between said coupling means on said bed; said axle means slidably engaging said track means for selective positioning therealong; and
(e) track extension means for removable attachment to said bed to extend said fixed track means across at least a portion of said coupling means and for slidably receiving said axle means, therefrom to thereby increase the maximum bridging distance between said axle means and said vehicle.

4,111,451
MULTI-TRAILER, DOLLY-CONNECTED, MOVABLE-AXLE, CONTAINERIZED CARGO TRAILER SYSTEM

Robert R. Pinto, 2900 Federal St., Camden, N.J. 08105

Continuation-in-part of Ser. No. 788,182, Apr. 18, 1977. This application Jul. 15, 1977, Ser. No. 816,047
Int. Cl.[2] B62D 53/06
U.S. Cl. 280—408 8 Claims



1. An apparatus for transporting a plurality of cargo containers, said apparatus being selectively coupleable to the fifth wheel of a tractor, comprising:

(a) a first elongate trailer comprising at least two coupling means, at least one disposed at each end thereof, for selective pivotal coupling with a tractor's fifth wheel;

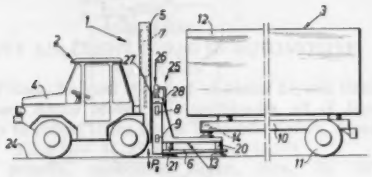
(b) a second elongate trailer comprising at least one coupling means for selective pivotal coupling with said tractor's fifth wheel; and

(c) a dolly means comprising at least two fifth wheels positioned for coupling with said coupling means of said first and said second trailers to tandem link said trailers, said dolly means further comprising a substantially elongate frame having at least two fifth wheels mounted at opposing ends thereof, and further comprising a plurality of axle means for supporting said elongate frame, said axle means being slidable along substantially the entire length of said frame for positioning at any of a plurality of preselected positions along said frame, and being slidable relative to each other as well as to said frame, said dolly frame further comprising at least two parallel tracking members engaging each of said axle means.

4,111,452
AUTOMATIC COUPLING UNIT FOR BRAKING AND ELECTRICAL FUNCTIONS BETWEEN PARTS IN A VEHICLE COMBINATION

Hans Åke Ulf Carlsson, Torsgatan 93, 341 00 Ljungby, Sweden

Filed Jun. 30, 1976, Ser. No. 701,161
Claims priority, application Sweden, Jul. 2, 1975, 7507595
Int. Cl.[2] B60D 7/02
U.S. Cl. 280—421 6 Claims

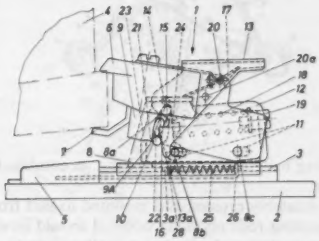


1. A coupling unit for releasably coupling a tractor vehicle and a trailer towed by said tractor vehicle comprising; a lift structure connectable to a tractor vehicle for movement upwardly and downwardly; said lift structure having support means for connection to a trailer for towing by the tractor vehicle and movable upwardly and downwardly relative to said lift structure; a connector system for automatically connecting braking and electrical systems of the tractor vehicle and the trailer; said connector system comprising, a female receptacle on said support means having therein separate first connector elements connected to the braking system and to the electrical system respectively of said trailer and a male unit on said lift structure having therein separate second connector elements connected to the braking and electrical systems respectively of said tractor vehicle, said first connector elements and said second connector elements each comprising means for automatically effecting connection to a corresponding one of the connector elements of a respective system when the male unit is inserted into the female receptacle a given extent as said lift structure is lifted relative to the female receptacle with the male unit coaxial with the female receptacle and for automatically effecting disconnection as the support means of the lift structure is lowered.

4,111,453
RELEASE BINDING

Erwin Krob, Vienna, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Dec. 14, 1976, Ser. No. 750,410
Claims priority, application Austria, Dec. 19, 1975, 9720/75
Int. Cl. A63c 9/08
U.S. Cl. 280—626 9 Claims



1. A releasable heel holder for holding a ski boot on a ski, comprising:

a base plate secured to said ski and having track means thereon extending in a direction parallel to the longitudinal axis of said ski;

a bearing block mounted on said base plate and including means cooperable with said track means for guiding said bearing block longitudinally thereof;

first resilient means for biasing said bearing block toward the tip of said ski;

slide means mounted on said bearing block and being reciprocal with respect thereto;

housing means having ski boot engaging means thereon pivotally mounted on said bearing block for movement about a pivot axis fixed to said bearing block between a position of use and a boot release position and in overlapping relationship to said bearing block and said slide means;

pin guide means in said slide means;

pin means received in said pin guide means and extending transversely of said ski and laterally beyond said housing means;

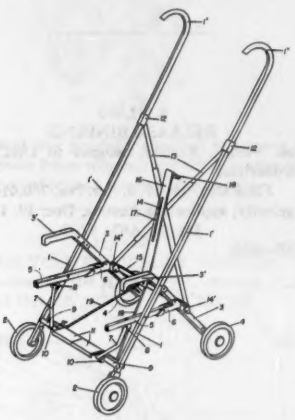
a lever movably secured to said housing means for movement between a release position and a position of use, said lever having a notch for receiving said pin means therein, a pivoting of said housing means effecting a movement of said lever therewith and a movement of said pin means in and relative to said pin guide means; and

releasable locking means mounted on said slide means and movable therewith, said locking means including means defining a threshold point and second resilient means yieldingly resisting movement of said pin means in said pin guide means past said threshold point.

4,111,454
FOLDING BABY CARRIAGE

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Continuation-in-part of Ser. No. 720,445, Sep. 3, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 839,118
Claims priority, application Japan, Jul. 15, 1976, 51-84593; Jul. 23, 1976, 51-99045[U]
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—649 **4 Claims**



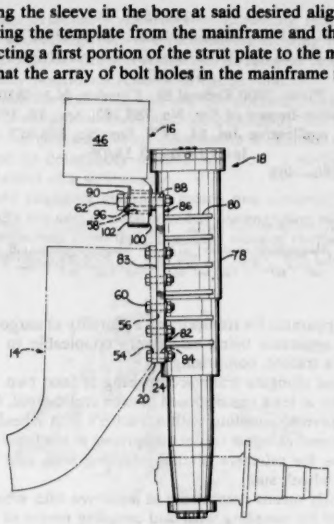
1. A folding baby carriage comprising, in combination:
front legs;
rear legs rotatably crossed and mounted to said front legs;
first connecting rods pivotally coupled to said front legs;
second connecting rods, having a U-shaped section, pivotally coupled to said first connecting rods at the front end, and pivotally coupled to said rear legs at the back end;
bent rods pivotally coupled to said first connecting rods at one end; and
front supporting rods pivotally coupled to said front legs at one end, and pivotally and foldably coupled to an opposite front supporting rod at the other end; and
wherein the other end of said bent rods is pivotally coupled to said front supporting rods, and
wherein said first connecting rods and said second connecting rods are straightened for the baby carriage to be locked in an opened state by weight of a baby exerted on front portions of said first connecting rods.

4,111,455
METHOD AND APPARATUS FOR MOUNTING A VEHICLE WHEEL ON A VEHICLE FRAME

Donald A. Hickman, and Samuel L. Kershaw, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 23, 1977, Ser. No. 809,343
Int. Cl.[2] B62D *65/00*
U.S. Cl. 280—690 **2 Claims**

1. A method for connecting a vehicle wheel to spaced apart mainframe and subframe portions of a vehicle frame using an alignment sleeve and a template representing a vehicle wheel strut plate comprising the steps of:
mounting a first portion of the template on the mainframe so that an array of bolt holes in the mainframe is aligned with a corresponding array of bolt holes in the template and so that a second portion of the template is adjacent the subframe;
placing the alignment sleeve through an enlarged bore in the subframe;
temporarily connecting the sleeve with the second portion of the template in a desired alignment;
securing the sleeve in the bore at said desired alignment;
removing the template from the mainframe and the sleeve;
connecting a first portion of the strut plate to the mainframe so that the array of bolt holes in the mainframe is aligned

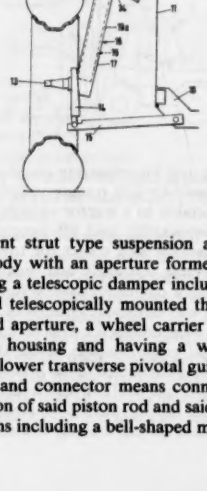


with a corresponding array of bolt holes in the strut plate; and
connecting a second portion of the strut plate to the subframe so that a bolt hole in the second portion is aligned with the alignment sleeve.

4,111,456
INDEPENDENT STRUT TYPE SUSPENSION ASSEMBLIES FOR VEHICLES

Willi Arnold, Nauheim; Rolf Pflughaupt, Rüsselsheim, and Bertold Felzer, Mainz, all of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 9, 1977, Ser. No. 805,113
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626392
Int. Cl.[2] B62D *17/00*
U.S. Cl. 280—692 **7 Claims**



1. An independent strut type suspension assembly for a vehicle having a body with an aperture formed therein, said assembly comprising a telescopic damper including a housing having a piston rod telescopically mounted therein and projecting through said aperture, a wheel carrier secured to the lower end of said housing and having a wheel rotatably mounted thereon, a lower transverse pivotal guide member for said wheel carrier, and connector means connected between the upper end portion of said piston rod and said vehicle body, said connector means including a bell-shaped member secured

to said upper end portion of said piston rod, and an annular rubber member retained between the open end portion of the bell-shaped member and the edge region of said aperture in said vehicle body, releasable connection means for at least a part of said bell-shaped member, providing on release of said connection means an opening permitting removal of parts of said damper therethrough for disassembly of said damper, and a helical wheel-suspension spring surrounding said damper with one end of said spring seated on said housing and the other end of said spring seated externally of such parts as have to be removed for disassembly of said damper.

4,111,457

INFLATABLE RESTRAINING DEVICE FOR MOTOR VEHICLES

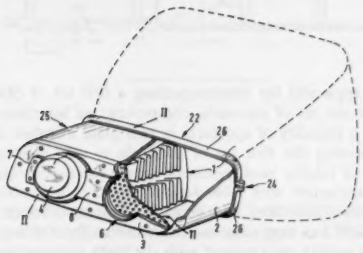
Adolf Kob, Erding, and Eduard Blatner, Augsburg, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Dec. 7, 1976, Ser. No. 748,156

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 7540488[U]

Int. Cl.² B60R *21/08*

U.S. Cl. 280—728 **11 Claims**



1. A restraining device for the occupants of a vehicle comprising an inflatable bag with a thickened edge at its opening, means for inflating the bag, a housing containing the bag in a folded condition, said housing having a flange for holding the bag, clamping means for connecting the thickened edge of the bag and the flange and an elastic profiled strip containing the thickened edge of the bag and arranged between the flange and the clamping means, the profiled strip having a channel with a configuration for receiving the thickened edge.

4,111,458

SAFETY AIR CUSHION BAG IN AUTOMOTIVE VEHICLES

Motohiro Okada; Katsumi Oka, both of Asaka; Kiyoshi Honda, Wako, and Kazuo Matsuura, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Nov. 11, 1976, Ser. No. 741,149

Claims priority, application Japan, Nov. 20, 1975, 50/15701[U]; Nov. 20, 1975, 50/157502[U]

Int. Cl.² B60R *21/08*

U.S. Cl. 280—739 **3 Claims**

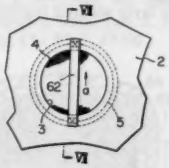
1. A safety air cusion bag for use in automotive vehicles, which comprises in combination:

(a) a foldable main body of said air cushion bag made of cloth impermeable to gas;

(b) at least one air outlet port formed in one part of said main body of the air cushion bag;

(c) a gas-permeable stretchable cover cloth which stretches with more difficulty in one direction than another, and is disposed on said air outlet port to close the same; and

(d) at least a single strip of foldable reinforcing band made of cloth impermeable to gas which is extended diametrically across said air outlet port, and between the opposing peripheral edges thereof, in parallel with the direction of



the greatest stretch difficulty of said gas-permeable cover cloth.

4,111,459

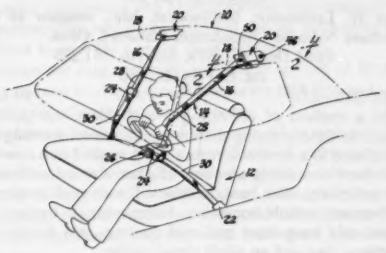
SEAT BELT UTILIZATION RECORDER

Joseph J. Magyar, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 9, 1977, Ser. No. 831,957

Int. Cl. B60r *21/10*

U.S. Cl. 280—744 **3 Claims**



1. An anchorage device for attaching a seat belt on a vehicle body structural member and for providing a record of imposition of a predetermined occupant restraint load on the seat belt, said anchorage device comprising: a seat belt mounting member having the seat belt attached thereto, said mounting member having an elongated slot extending generally in the direction of imposition of occupant restraint load and having a load bearing wall at one end of the slot, a fastener extending through the slot and attaching the mounting member on the structural member, means located in the slot in interposition between the fastener and the load bearing wall to space the load bearing wall from the fastener, said means having a predetermined limited load sustaining capability and being permanently altered upon imposition of an occupant restraint seat belt load greater than the predetermined load sustaining capability to provide a permanent record of load imposition and permit limited bodily shifting movement of the mounting member whereby the fastener traverses the slot to engage the load bearing wall and thereby anchor the seat belt for restraint of the occupant.

4,111,460

BOOK WITH COVER AND METHOD AND APPARATUS FOR MAKING THE COVER

Alvin V. Roberts, 68 Popham Rd., Scarsdale, N.Y. 10583

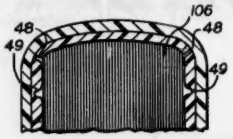
Continuation-in-part of Ser. No. 578,339, May 16, 1975, abandoned, which is a division of Ser. No. 343,017, Mar. 21, 1973, Pat. No. 3,884,742. This application Nov. 24, 1976, Ser. No. 744,787

Int. Cl.² B42D *3/02*

U.S. Cl. 281—29 **9 Claims**

1. A book including a filler and a cover connected to the filler, said cover having front and rear cover panels connected

to one another by a back panel and with hinge lines of less thickness than the front and rear cover panels adjacent to the junction of the back panel with the front and rear panels, all of the panels being made from a plastic laminate that has an inner layer and an outer layer secured together in an integral structure, one of the layers being a material that is softened to a flowable condition by electromagnetic radiation of a given frequency, and the other layer being made of plastic material less affected by said radiation and that remains in a substantially non-flowable condition when subjected to the same radiation that softens the first layer.



4,111,461

BARRIER COAT FOR GROUNDWOOD CARBONLESS COATED PAPER

George W. Levensalor, Millinocket, Me., assignor to Great Northern Nekoosa Corporation, Stamford, Conn.

Filed Dec. 16, 1976, Ser. No. 751,205
Int. Cl.[2] B41L *1/36*
U.S. Cl. 282—27.5 10 Claims

1. In a method of providing a carbonless non-yellowing pressure sensitive copying sheet wherein a color forming agent encapsulated in a synthetic resin shell is applied as a coating to a base sheet containing amounts of groundwood sufficient to cause yellowing after being contacted with said coating, the improvement which comprises interposing a barrier layer between said base sheet and said coating, said barrier layer comprising clay and an alkali metal sulfite.

6. A coated substantially non-yellowing copying sheet including a base sheet containing sufficient amounts of groundwood to cause yellowing when contacted with a color forming coating containing a color forming agent encapsulated in a polyamide resin containing excess amine, a barrier layer coated directly on said base sheet, said barrier layer containing clay and an amount of an alkali metal sulfite sufficient to inhibit such yellowing, and a color forming layer over said barrier layer, said color forming layer including said color forming agent encapsulated in said polyamide resin.

4,111,462

LATENT, SENSITIZING INK

Heinz E. Lange, Saint Paul, and Dean A. Ostlie, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 15, 1975, Ser. No. 596,180
Int. Cl.[2] B41L *1/20;* C09D *11/00*
U.S. Cl. 282—27.5 11 Claims

1. A latent printing ink for providing latent, sensitized areas on substrates, which ink can be applied to a paper substrate by a printing press and subsequently developed with a pressure-releasable, encapsulated, color-activating compound carried on a substrate, said ink comprising, based on the weight of the total ink composition, about 5 to 55% by weight of a vehicle component which is a non-polymeric, oleophilic, organic, proton donor acid anion having a cationic counter-ion, up to about 70% by weight oil-receptive, particulate filler and up to about 30% by weight thinner and wherein said ink includes at least 5% by weight of at least one color-generating component, the ratio of said filler to said vehicle component being from about 0.5:1 to 6:1.

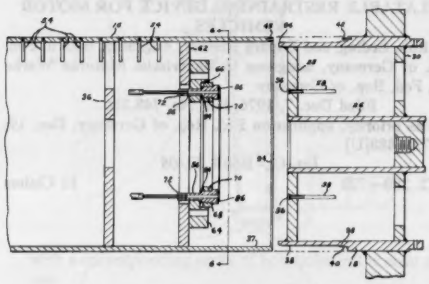
11. A multi-sheet form comprising a first sheet having on the reverse surface a color-activating component and, underlying said first sheet, a second sheet having at least a portion of the obverse surface sensitized with the latent, sensitizing ink of claim 1.

4,111,463

SEPARABLE COUPLING FOR PLURAL PRESSURE LINES

Buryl L. McFadden, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 7, 1977, Ser. No. 804,488
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—25 5 Claims



1. An apparatus for interconnecting a first set of channels and a second set of channels, comprising: an interface plate member; a plurality of apertures in said plate member; means for connecting the first set of channels to said apertures; a plurality of tubular stud members; means for supporting said studs in alignment with said apertures; an O-ring surrounding each of said apertures and being positioned between each tubular stud and said plate member; means for holding each O-ring in sealing engagement with the plate member and one of said tubular studs; said means for supporting said stud member in alignment with said apertures including a mounting plate member; a guide member slidably supported on said mounting plate member; said guide member being slidable with respect to said mounting plate member; a plurality of holes in said guide member; one of said stud members being positioned in each of said holes in the guide member; each of said stud members having a first shoulder for engaging said guide member on the side remote from said mounting plate member; a plurality of holes in said mounting plate member, in alignment with the holes in the guide member, for receiving said stud members; means for retaining each of said stud members within said guide member and said mounting plate member.

4,111,464

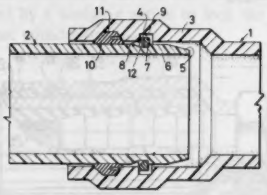
PIPE JOINT LOCKING RING AND GROOVE ARRANGEMENT

Teryoshi Asano, Kawagoe; Sadao Fukuoka, Hatoyama, and Takashi Sawada, Tokorozawa, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 17, 1977, Ser. No. 759,700
Claims priority, application Japan, Jan. 19, 1976, 51-4711[U]; Apr. 19, 1976, 51-49328[U]; Apr. 20, 1976, 51-49494[U]
Int. Cl.[2] F16L *25/00*
U.S. Cl. 285—111 9 Claims

1. In a snap-insertion pipe joint including a first synthetic resin pipe (1) having an enlarged, female receiving end (3) with a first circular groove (11) and a second circular groove (9) having side walls perpendicular to the pipe axis in its inner periphery, the first groove being closer to the end of the pipe than the second groove, a second synthetic resin pipe (2) having a male insertion and (6) with a tapered outer edge (5) and a third circular groove (7) in its outer periphery, the third groove having a side wall nearest the outer edge perpendicular

to the pipe axis and a tapered opposite side wall (8), a packing ring (10) disposed in the first groove, and a locking ring (4) disposed in an annular space defined by the second and third grooves when the first and second pipes are assembled together, the improvements characterized by:



(a) the locking ring being an endless or continuous ring of substantially rectangular cross-section and formed of a relatively rigid synthetic resin material, and

(b) the normal or unassembled inner diameter of the locking ring being smaller than the outer diameter of the insertion end of the second pipe but at least 9/10 the diameter thereof.

4,111,465

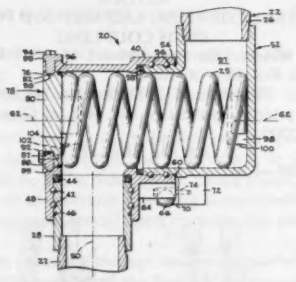
TORSIONALLY CONTROLLED SWIVEL JOINT

Houston W. Knight, Whittier, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 26, 1976, Ser. No. 745,133

Int. Cl.² F16L *27/00*

U.S. Cl. 285—114 **28 Claims**



1. A torsionally controlled pipe swivel joint comprising a first swivel joint section, a second swivel joint section connected in fluid tight engagement with said first section for rotation about a predetermined axis, said first and second sections defining a fluid flow passage therethrough, a torque element diposed within said flow passage, anchoring means secured to each section for anchoring opposite ends of said torque element to associated ones of said swivel joint sections for torsionally resisting rotation of one section relative to the other, and means for adjusting and locking the position of said torque element with respect to one of said first and second sections to selectively vary the torsional force exerted on said sections by said torque element without preventing free relative rotation of said sections.

4,111,466

COLLAPSIBLE TANKER HOSE COUPLING

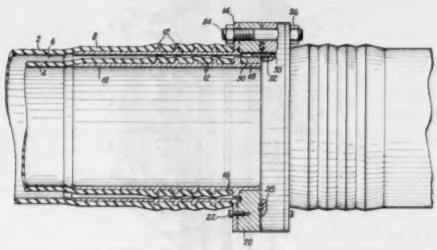
Alfio D. A. Deregibus, Via Livorno, 5 Padora, Italy

Filed Feb. 4, 1977, Ser. No. 765,768

Claims priority, application Italy, Feb. 2, 1976, 41512 A/76

Int. Cl.² F16L *47/00*

U.S. Cl. 285—133 R **3 Claims**



1. A flexible hose structure for loading and unloading petroleum products from tankers, comprising:

an inner elastomeric and flexible tubular hose;

an outer elastomeric and flexible tubular hose concentrically surrounding said inner hose and spaced outwardly therefrom to provide a space therebetween;

a connector ring sealingly secured at an end of both said hoses and having means for securing said ring to a similar ring on adjacent concentric hoses;

a separate tubular metallic fitting secured to said end of each hose, said fittings being secured to said connector ring in concentric but radially spaced relation, said connector ring being provided with at least one axially extending passage therethrough between said tubular metallic fittings and communicating with said space between said hoses.

4,111,467

ROTATABLE COUPLING FOR A PLURALITY OF CONDUITS, PARTICULARLY FOR A BUOY

Frank P. de Fremery, Schiedam, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed Apr. 13, 1977, Ser. No. 786,995

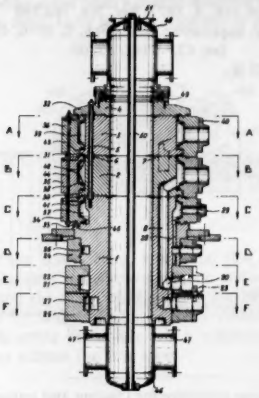
Claims priority, application Netherlands, Apr. 13, 1976, 7603915

Int. Cl.² F16L *39/00*; B65G *67/58*

U.S. Cl. 285—136 **6 Claims**

1. Rotatable coupling for a plurality of conduits for different media, particularly for a buoy or similar loading and unloading device, said coupling comprising a stationary core member, said core member being provided with a number of axial passageways connecting to conduits coupled to the core member and said passageways at various levels connecting to circular spaces via crossbores, said spaces being constituted between a number of rotatable ring members disposed in axial arrangement on top of each other and the core and being sealed with respect to the core and each one of said passageways connecting to a conduit via a radial bore, characterized in that core member, at least at the level of the rotatable ring members, comprises a pack of stacked bodies connected to each other by tension bolts or the like, each body possessing a radially pro-

jecting flange and the rotatable ring members surrounding said stacked bodies and being axially enclosed with ample play in



radial direction between said flanges and being sealed in axial direction with respect to said flanges.

4,111,468

HYDRAULIC BORING DEVICE

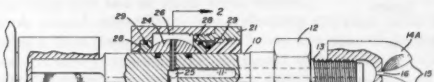
Michael Schneider, 1120 S. Union Ave., Alliance, Ohio 44601

Continuation-in-part of Ser. No. 636,593, Dec. 1, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,459

The portion of the term of this patent subsequent to Jun. 4, 1991, has been disclaimed.

Int. Cl.[2] F16L *27/00*

U.S. Cl. 285—190 **4 Claims**



1. A rotary fluid coupling comprising a cylindrical housing, a cap in one end of said housing, a hollow shaft disposed in said housing, said shaft extending outwardly of at least one end of said housing, a port in one side of said housing, an annular channel in said housing communicating with said port, a sphere positioned on said shaft in the area of said annular channel, passageways in said shaft and sphere establishing communication between said hollow shaft and said annular channel in said housing and annular sealing members formed of slippery plastic material positioned in said housing and engaged on opposite sides of said sphere adjacent said shaft and on portions of said shaft adjacent said sphere, a substantially large sealing sleeve formed of slippery plastic material engaged on a substantially large area of said shaft and abutting one of said annular sealing members and adjustably engaged in said cap, said sealing members engaging said housing and said cap respectively, said sealing members and sealing sleeve rotatably supporting, positioning and sealing said hollow shaft and sphere relative to said housing and cap.

4,111,469

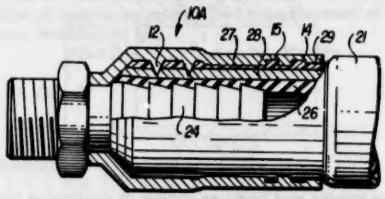
HYDRAULIC HOSE AND COUPLING ASSEMBLY

Edward M. Kavick, Chardon, Ohio, assignor to Samuel Moore and Company, Aurora, Ohio

Filed Dec. 23, 1976, Ser. No. 753,896

Int. Cl.[2] F16L *33/20*

U.S. Cl. 285—256 **10 Claims**



1. A hydraulic hose comprising a core tube, a layer of reinforcing material disposed about the core tube and a protective sheath about the reinforcing material and on at least one end thereof a permanently attached coupling member comprising a body portion having means for connecting the coupling member to a source of fluid at one end thereof and a nipple extending from an opposite end thereof inserted in the core tube, an external annular member disposed between the connecting means end and the nipple, an external annular groove disposed adjacent the annular member on the side thereof facing the nipple, a shell disposed substantially concentrically about the nipple having an inner wall thereof disposed about the sheath of the hose and having one end thereof embedded in said external annular groove to permanently secure the shell to the body portion, said shell having a plurality of circumferentially spaced three-dimensional barbs on its inner wall with a minimum dimension at the base thereof greater than the thickness of the shell wall at the barb location, said barbs piercing the sheath and embedded in the reinforcing material and said shell comprising the sole external means of attaching the coupling member to the hose.

4,111,470

RELEASABLE COUPLING AND METHOD FOR MAKING SUCH COUPLING

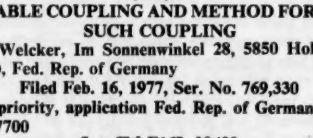
Friedrich Welcker, Im Sonnenwinkel 28, 5850 Hohenlimburg (B.R.D.), Fed. Rep. of Germany

Filed Feb. 16, 1977, Ser. No. 769,330

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607700

Int. Cl.[2] F16L *39/00*

U.S. Cl. 285—320 **15 Claims**



1. A releasable coupling for securing a deformable tubular member having a first longitudinal axis, to a further member comprising an aperture with a second longitudinal axis extending coaxially with said first longitudinal axis to receive said deformable tubular member in said aperture of said further member, a hole in said further member located adjacent to said aperture in such a position relative to said aperture that the volume of the hole partially overlaps the volume of the aperture for said deformable, tubular member, locking pin means in said hole, said locking pin means comprising actuating means at one end thereof and a flattened side region intermediate its ends and located at the level of said overlapping volume when said locking pin means is inserted in said hole, whereby the

locking pin means may be initially inserted into said hole so that said flattened side region of said locking pin faces said deformable tubular member without initially deforming the deformable tubular member inserted in said aperture, and wherein rotation of said locking pin means in said hole in a direction against withdrawal of said deformable tubular member deforms said deformable tubular member first by a denting action followed by a wedging action to lock the latter in said aperture against withdrawal.

4,111,471

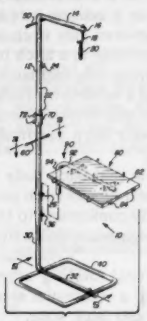
MACRAME RACK APPARATUS

Don N. Hanley, 100 Hilltop Dr. #14, Redding, Calif. 96001

Filed Jan. 27, 1977, Ser. No. 763,006

Int. Cl.[2] B65H *69/04*

U.S. Cl. 289—18 **5 Claims**



1. Macrame rack apparatus, comprising, in combination, a base;

tubing means secured to and supported by the base, and including

a first pair of apertures extending diametrically through the tubing means,

a first pin extending through the first pair of apertures and movable in the apertures and defining side to side movement relative to the base and the tubing means,

a second pair of apertures extending diametrically through the tubing means spaced apart from the first pair of apertures,

a second pin extending through the second pair of apertures substantially parallel to the first pin and movable in the apertures defining side to side movement relative to the base and the tubing means,

a plurality of holes in the tubing means spaced apart from each other substantially perpendicular to the first and second pairs of apertures, and

a hook for holding macrame cord and insertable into and removable from any of the plurality of holes;

an arm secured to the tubing means remote from the base and substantially perpendicular to the first and second pins;

holding means secured to the arm for holding macrame cord; and

table means secured to the tubing means for holding a macrame project and disposed between the base and the plurality of holes.

4,111,472

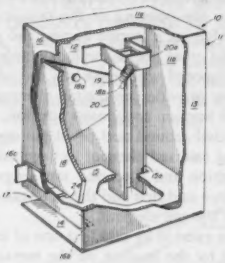
TAMPER-PROOF EMERGENCY EXIT WINDOW GRATE

Loring E. Smith, 37 Hadley Rd., Sudbury, Mass. 01776, and Mario J. Aloisi, 843 Chandler St., Tewksbury, Mass. 01876

Filed May 9, 1977, Ser. No. 794,715

Int. Cl.[2] E05C *15/02, 1/06*

U.S. Cl. 292—92 **7 Claims**



1. A tamper-proof, hinged, emergency exit panel adapted to be mounted in an opening of a building and comprising:

(a) a locking enclosure mounted adjacent the edge of the panel and characterized in that all of its walls which do not face the building are solid, that it has an inner facing slot opening into its interior and that it has an access door covering its inner face;

(b) a vertical blocking member spaced within said enclosure;

(c) means spaced within said enclosure for elevating said blocking member and comprising a hand-actuable plate pivotally connected to a side wall of the enclosure and to said vertical blocking member;

(d) a locking member adapted to extend from the building through said slot and being lockable in said enclosure by said vertical locking member;

said panel being so characterized that pressure on said plate below the pivot point elevates said blocking member to permit said panel to be readily swung open over said locking member by virtue of said slot.

4,111,473

BOX OPENING DEVICE

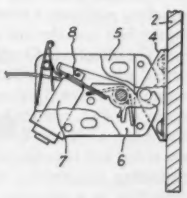
Georges Bourrie, Neuilly-sur-Seine, and Robert Lensel, Bourg la Reine, both of France, assignors to R. Alkan & Cie, Valenton, France

Filed May 17, 1977, Ser. No. 797,714

Claims priority, application France, Jul. 23, 1976, 76 22636; Mar. 11, 1977, 77 07334

Int. Cl.[2] E05C *3/30*

U.S. Cl. 292—126 **6 Claims**



1. An electro-mechanical locking device, for keeping in a closed position the door of a box such as a box for safety equipment on an aircraft and permitting the automatic and manual opening of said door, said device comprising:-

(i) a lock staple secured at an inner face of the door and provided with a cross pin,

(ii) a compound hook disposed within said box and comprising a U-shaped tail element having an intermediate wall to an outer face of which is secured a metal plate, said tail element being pivotable about a pivot pin, and

(iii) a nose element disposed within said tail element and pivotable with respect thereto about said pivot pin, said nose element having a first end portion abutting against an inner face of said intermediate wall to be positively moved thereby when said tail element rotates about the pivot pin in a direction for opening of the compound hook, said nose element having a second curved end portion adapted to engage said cross pin of the lock staple,

(iv) a magnet disposed within the box and adapted to co-act with said plate provided on the tail element of the hook to maintain said hook in the closed position,

(v) a spring coiled around said pivot pin and having a first arm engaging said tail element to urge said hook toward an open position and a second arm engaging said nose element to urge said first end thereof against said intermediate wall of the tail element,

whereby the force exerted by said first arm of the spring, when the force exerted by the magnet on the metal plate becomes lower than a predetermined value, ensures a rotation as a unit of the compound hook to open the box door, whereas with the door open and the hook being returned to its closure position in which the action of the magnet retains the compound hook, the closure of the box door is permitted by rotation of the nose element against the action of said second arm of the spring.

4,111,474

ELECTRICALLY OPERATED DOOR LOCK

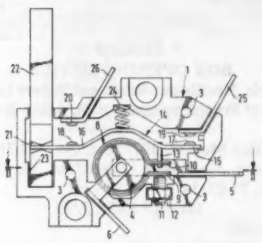
Konard Heydner, Altdorf, Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf, Germany

Filed Jun. 16, 1977, Ser. No. 807,323

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628597

Int. Cl.² E05B *51/00*

U.S. Cl. 292—144 **11 Claims**



1. In an electrically operated door lock including a bolt having locking and unlocking positions; a bimetal strip coupled to the bolt for moving the bolt into the one or the other bolt position dependent upon the direction of temperature-effected deformation of the bimetal strip; and a resistor for heating the bimetal strip for effecting deformation thereof; the improvement wherein said resistor is a PTC resistor having a generally cylindrical body, and wherein said bimetal strip is formed of a generally circular open collar and two spaced legs; said collar circumferentially surrounding said resistor and continuing in said legs; said legs extending in a direction away from said resistor; one of said legs constituting a bolt-actuating terminus; said bolt being arranged on that side of said resistor that is oriented away from said bolt-actuating terminus; the improvement further comprising a bimetal connecting bar coupling said bolt-actuating terminus with said bolt, said bimetal connecting bar extending adjacent and along a face of said collar oriented away from said resistor.

4,111,475

SELF-LATCHING YOKE GATE LATCH

Donald Hugh McCormick, 1408 Pioneer Way, and William Weldon Perkins, 12044 Royal Rd., #20, both of El Cajon, Calif. 92020

Filed May 19, 1977, Ser. No. 798,340

Int. Cl.² E05C *3/24*

U.S. Cl. 292—216 **6 Claims**

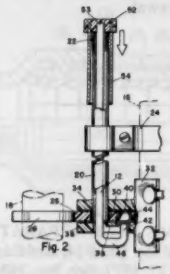


Fig. 2

1. An improved self-latching yoke gate latch including a latch body mounted on a first vertical support, a latch yoke pivotally supported on a bearing axis in said latch body for pivotal movement between gate open and gate latched positions, a latch pin receivable in a latch bore in said latch yoke spaced from said bearing axis, said latch pin having a vertical latching segment, and a vertical operator segment, and a latch operator connected to said vertical operator segment for selectively withdrawing said latch pin from said latch bore, the invention comprising:

a latch pin recess in said latch body for accommodating a horizontal segment of said latch pin,

said recess generally conforming to the length and width of said horizontal segment to limit entry of pry tools into said recess,

said latch pin vertical latching segment terminating in a blunt end having a substantial area of contact with the undersurface of said latch yoke,

a tapered bushing received in said latch bore,

said tapered bushing being comprised of a material having a greater hardness than the hardness of said latch yoke,

said bushing having an opening that tapers from a diameter substantially greater than said latch pin to a diameter substantially equal to that of said latch pin.

4,111,476

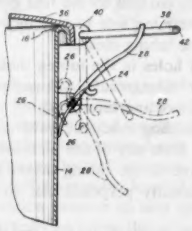
LATCH HANDLE AND CONTAINER LOCK

Stanley A. Jacobs, 45 Kohary Dr., New Haven, Conn. 06515

Filed Jun. 15, 1977, Ser. No. 806,602

Int. Cl.² B65D *45/16*; E05C *19/10*

U.S. Cl. 292—246 **9 Claims**



1. A latch arrangement for a container and associated lid comprising:

a latch arm having inner and outer ends;

means mounting the said latch arm between its ends, to the exterior of the sidewall of said container below the rim thereof and for pivotal movement between a first and second position about a substantially transverse axis, said axis being spaced outwardly from the sidewall of said container;

said inner end of said latch arm being of resilient, deformable and flexible construction, the distance between said pivotal axis and the closest region of said container sidewall being less than the distance from said pivotal axis to the extremity of said inner end of said latch arm, whereby said latch arm inner end is resiliently deformed when said latch arm is pivoted from one of its positions to the other, a region of said container sidewall being cooperative with the inner end of the latch arm when the latch arm is in either of its positions to retain the latch arm in that position;

a member connected to and extending downwardly from the periphery of the container lid, said member having a transverse portion thereof which, when the lid is on the container, may extend downwardly and be engaged by a portion of said latch arm;

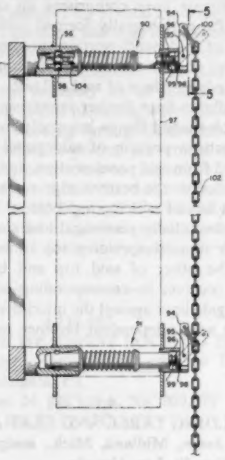
said portion of said latch arm including means for engaging said transverse portion of said member to retain said member and draw said lid member downwardly in response to pivotal movement of said latch arm from one position thereof to the other.

4,111,477

WINDOW GUARD RELEASE

Paul D. Rigali, 711 N. Bush, Anaheim, Calif. 92805

Filed Jun. 13, 1977, Ser. No. 806,023
Int. Cl.[2] E05C *13/04*
U.S. Cl. 292—252 **5 Claims**



1. A window guard system for securing a window guard to an adjacent wall while simultaneously providing for quick release from said wall comprising:

a window guard movably mounted on said wall between a closed position covering a window in said wall and an open position not covering the window;

a keeper attached to said window guard, said keeper having a bore therein opening towards said wall, and said keeper extending into said wall;

a flat plate-like shield firmly attached to and surrounding said keeper and engaging said wall, when said guard is in said closed position, to prevent access to the interior of the wall;

a pin fixed to said adjacent wall and extending at least partially through said wall and into the bore in said keeper;

means for releasably locking said pin within the bore of said keeper; and

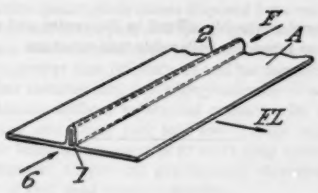
means connected to said pin and located on the interior of said wall for releasing said keeper from locking engagement with said locking pin.

4,111,478

SYSTEM FOR CONTROLLING THE DEFORMATION OF SIDE ELEMENTS OF VEHICLE BUMPERS

Michel Pompei, Paris, and Christian Robert Casse, St. Cloud, both of France, assignors to Paulstra, Levallois Perret, France

Filed Feb. 4, 1977, Ser. No. 765,603
Claims priority, application France, Feb. 5, 1976, 76 03194
Int. Cl.[2] B60R *19/02*
U.S. Cl. 293—63 **7 Claims**



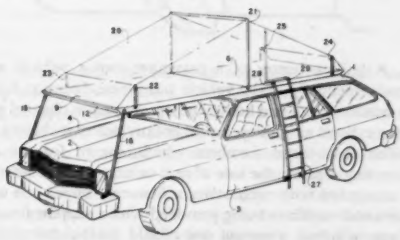
1. In a side element for motor vehicle bumpers formed of synthetic deformable material and having at least one generally planar surface, the improvement comprising armature means, formed of strong and rigid material relative to said synthetic deformable material, to ensure that upon deformation of said side element said generally planar surface will buckle substantially in a direction transverse to said armature means, said armature means comprising a generally planar plate, said plate being at least partially embedded in said generally planar surface of said side element, and extending generally perpendicular to the plane of the synthetic deformable material in which it is at least partially embedded, whereby the plane of said deformable material and the plane of said armature are disposed at approximately right angles.

4,111,479

VEHICLE TOP CAMPER

John D. Rizzotto, Sr., Abington, Mass., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jun. 15, 1977, Ser. No. 806,950
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 MC **2 Claims**



1. A vehicle top camper mounted on the roof of a motor vehicle having a roof, sides and a front bumper, said vehicle top camper comprising

a first platform affixed to the roof of the vehicle;

a second platform hingedly affixed to the first platform and extending from the roof to an area over the front bumper in extended position and in juxtaposition with the first

platform in storage position, each of the first and second platforms having a front edge and a rear edge;

brace means for removably supporting the front edge of the second platform at a predetermined distance above the front bumper to maintain said second platform substantially horizontal;

center truss means foldably affixed to the sides of the first platform at the front edge thereof and extending substantially perpendicularly therefrom in extended position;

first end truss means foldably affixed to the sides of the second platform at the front edge thereof and extending substantially perpendicularly therefrom in extended position;

second end truss means foldably affixed to the sides of the first platform at the rear edge thereof and extending substantially perpendicularly therefrom in extended position; and

tent material releasably affixed to the center and end truss means to provide a collapsible tent structure.

4,111,480

HOLLOW BEARER OF A PASSENGER MOTOR VEHICLE

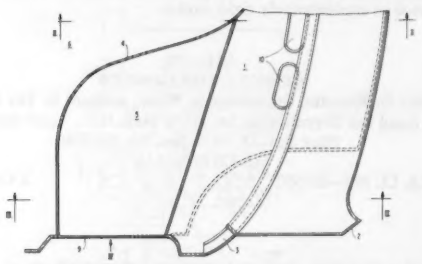
Werner Breitschwerdt, Stuttgart; Sigmund Kania, Sindelfingen; Theodor Ukena, Schonaich, and Otto Schwämmle, Simmozheim, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 10, 1977, Ser. No. 776,248

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610732

Int. Cl.[2] B60R *21/04;* B62D *25/00*

U.S. Cl. 296—28 R **10 Claims**



1. A hollow bearer of a passenger motor vehicle which extends essentially in the vehicle transverse direction below a rear windowpane, said hollow bearer serving as channel means for the exhaust air guidance, said hollow bearer including three profiled sheet-metal members which, except for the offset connecting areas on the side of rear columns, are non-detachably connected with each other, a first, rear upper one of said sheet-metal members being provided with a support flange for the rear window, a second one of said sheet-metal members, which is equipped with inlet openings for the exhaust air, adjoining said first sheet-metal member within the area of the support flange in the direction of a hat storage shelf, and said first and second sheet-metal members being completed into an air guide channel by a third closure sheet-metal member disposed therebelow, characterized in that the closure sheet-metal member forms the rear termination of a sheet-metal bearer member for the hat storage shelf.

4,111,481

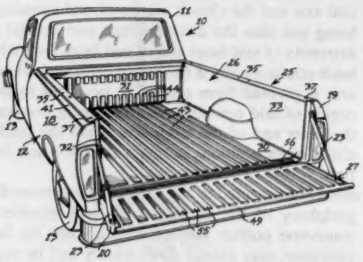
TRUCK BED LINER

Edwin Lee Nix, 733 Tahlena Ave., and Bobby E. Davenport, 317 Beckley Dr., both of Madison, Tenn. 37115

Filed Feb. 17, 1977, Ser. No. 769,580

Int. Cl.[2] B62D *33/00*

U.S. Cl. 296—39 R **8 Claims**



1. A protective liner for a truck bed having a bottom wall, a front wall, opposed side walls and a substantially rectangular tailgate having an interior surface, an exterior surface, an elongated top edge surface and an elongated bottom edge surface, comprising:

(a) a substantially rectangular, independently formed, tailgate liner,

(b) said tailgate liner comprising a panel portion having a front face, a rear face, an elongated top portion and an elongated bottom portion, said rear face being adapted to fit against the interior surface of said tailgate,

(c) said tailgate liner comprising an elongated top hook-shaped flange integrally formed with the elongated top portion of said panel portion, projecting rearward from said panel portion and adapted to conform to and receive the top edge surface of said tailgate,

(d) said tailgate liner further comprising an elongated bottom hook-shaped flange integrally formed with the elongated bottom portion of said panel portion, projecting rearward from said panel portion, and adapted to conform to and receive the bottom edge surface of said tailgate,

(e) at least one of said top and bottom hook-shaped flanges being substantially semi-rigid and elastic for snap-fastening over its corresponding top or bottom edge surface, when the other of said top and bottom hook-shaped flanges receives its corresponding edge surface, to hold said tailgate liner against the interior surface of the tailgate without any independent fastener member, in operative position.

4,111,482

FOLDING TABLE AND SEAT ASSEMBLY

William C. Jones, Midland, Mich., assignor to Franklyn M. Markus, Cote St. Luc, Canada

Filed Oct. 17, 1977, Ser. No. 842,573

Int. Cl.[2] A47B *39/00*

U.S. Cl. 297—159 **24 Claims**

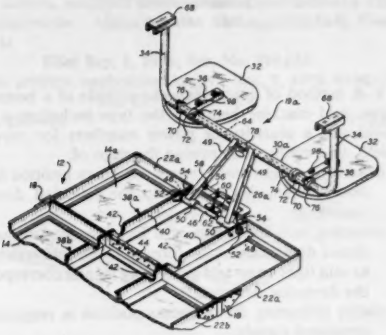
1. In a folding table and seat assembly of the type wherein said seat and table are relatively pivotally movable between an opened position wherein said table and seat are substantially parallel to one another and said seat is disposed adjacent and below one end of said table, and a closed position wherein said seat is in confronting, substantially parallel relation with said table, an improved assembly for supporting said table and seat in said opened position and for permitting said pivotal movement, said assembly comprising:

a table support member connected at one end thereof to the underside of one end of said table for pivotal movement with respect to said table between first and and second

positions corresponding, respectively, to said opened and folded positions;

an elongated seat support member fixedly joined to the other end of said table support member, said seat support member comprising an elongated cylindrical tubular member having a circular axial bore extending therethrough, the axis of said tubular member being substantially parallel to the pivotal axis of said table support member;

a seat base connected to said seat and including a boss having a circular aperture thereon, said seat support member pivotally extending through said circular boss aperture, cooperating stop means on said circular boss and on said seat support member for limiting the pivotal movement of said seat base relative to said seat support member between two extreme positions corresponding to said open and closed positions; and



a pair of elongated legs and means for mounting said legs to said seat support member for pivotal movement relative to said seat support member, said legs being shaped to move to a closed position in which they confront and are in substantially a parallel relationship with said table when said table and seat assembly are in said closed position, said leg mounting means including a circular shaft operatively coaxially extending through said axial bore in said seat support member for pivotal movement therein, each of said legs being connected to respective ends of said shaft for pivotal movement therewith between an open position in which said legs extend vertically when said table is in an elevated horizontal position and said closed position, and means for releasably holding said legs in said open position.

4,111,483

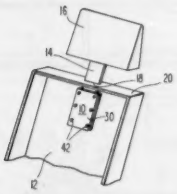
DENTAL CHAIR HEADREST LOCKING DEVICE

Robert Charles Jaeger, Howell, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 24, 1977, Ser. No. 809,579

Int. Cl.[2] A47C *1/10*

U.S. Cl. 297—410 **7 Claims**



1. A dental chair adjustable headrest and locking mechanism therefor, said headrest comprising a head support member and said locking mechanism being affixed interiorly an upper central portion of a backrest of said chair, said backrest including an uppermost portion having a centrally disposed longitudinal slot therein,

a substantially rectangular bar member having at least a pair of opposed flat surfaces,

said bar member being disposed within said slot for axial movement therethrough and having one end permanently affixed to a lower central portion of said head support member and its other end cooperating with said locking mechanism,

said locking mechanism comprising a pair of rigidly supported parallel pads of high friction material, said pair of rigidly supported parallel pads of high friction material consisting of a lower pad and an upper pad, said contact between said pads and said bar member resulting from force of gravity, said contact occurring at an upper portion of said lower pad and a lower portion of said upper pad,

low friction spacer guide means disposed between said upper pad and said lower pad, said spacer guide means providing a space between said upper pad and said lower pad just barely greater than thickness of said bar member such that said bar member may move longitudinally of said locking mechanism without substantial contact with said upper pad and said lower pad, said low friction spacer guide means being so arranged as to exert drag control on said bar member to prevent gravitational downward movement of said head support member,

said contact of said bar member with said upper portion of said lower pad and said lower portion of said upper pad being overcome when said head support member is pushed to a more vertical position whereby said headrest in adjustable within said locking mechanism.

4,111,484

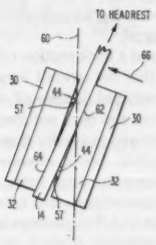
DENTAL CHAIR HEADREST LOCKING DEVICE

Robert Charles Jaeger, Howell, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jul. 25, 1977, Ser. No. 818,638

Int. Cl.[2] A47C *1/10*

U.S. Cl. 297—410 **10 Claims**



1. A dental chair including an adjustable headrest and a locking mechanism therefore, said chair comprising a backrest having an upper member provided with a centrally disposed longitudinal slot, said headrest comprising a head support member and an elongated bar member having one end affixed to a lower central portion thereof and adapted to be received in said slot for movement therethrough, said locking mechanism being affixed interiorly to an upper central portion of said backrest, said locking mechanism engaging the other end of said bar member, said bar member being substantially rectangular in cross section and having at least a pair of opposed flat surfaces, said locking mechanism comprising:

a. a pair of rigidly supported pads in parallel relationship, said pads being made of high friction material, said pads providing a space for slidably receiving said bar member to provide high friction contact between opposed faces of said pads and said opposed flat surfaces of said bar mem-

ber when said bar member contacts said pads in a non-vertical position,

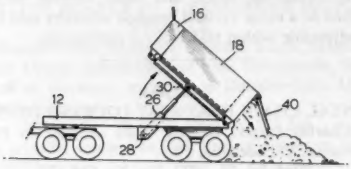
b. a low friction material, spring-loaded block extending through each of said pads and into said space provided by said pads, each of said blocks contacting an opposed flat surface of said bar in staggered coupling relationship when said bar is in a vertical position and non-vertical position, said blocks being substantially simultaneously compressed upon application of a force to said head support member in a direction which reduces contact between said pads and said flat surfaces of said bar member.

4,111,485

DUMP TRUCK WITH TELESCOPING CONTAINER BODY

John C. Martin, and Paul H. Martin, both of Toronto, Canada, assignors to Diesel Equipment Limited, Toronto, Canada

Filed Jan. 17, 1977, Ser. No. 759,877
Claims priority, application Canada, Apr. 26, 1976, 250998
Int. Cl.[2] B60P *1/28*
U.S. Cl. 298—1 B **14 Claims**



1. In a dump truck having a longitudinally extending support frame, the improvement of;

(a) a container body having an overall length which is variable and consisting of;

(i) a front section and a back section telescoped one within the other such that the overall length of the container body is the combined length of the front and back sections, said front and back sections having a container compartment formed inwardly thereof;

(ii) said front section being mounted for longitudinal movement relative to said frame and back section whereby said front section may extend forwardly from said back section to a first position in which the overall length of the container body is at a maximum and a second position in which said front section is telescoped with respect to said back section to reduce the overall length of the container body to a stable tippable length,

(iii) said back section being pivotally mounted on said frame so as to be movable between a lowered position for transporting a load and an elevated position for dumping a load, and

(b) first drive means associated with said front section for driving said front section longitudinally of said frame between said first and second positions thereby to effect a partial discharge of a load contained within said container compartment rearwardly from said back section in response to movement towards said second position in use,

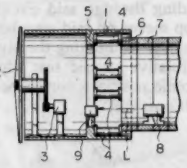
(c) second drive means associated with said back section for moving said back section from said lowered position to said elevated position to complete the discharge of a load from said common container compartment.

4,111,486

METHOD AND SYSTEM FOR PERFORMING ATTITUDE CONTROL OF TUNNEL EXCAVATING SHIELD

Yoshihiro Kumaki, Urawa; Junpei Kawade, Ichikawa; Toshiaki Takano, Tokyo, and Mitsuo Inoue, Chiba, all of Japan, assignors to Tekken Construction Co. Ltd., Tokyo, Japan

Filed Apr. 27, 1977, Ser. No. 791,245
Int. Cl.[2] E21D *9/08*
U.S. Cl. 299—1 **13 Claims**



1. A method of controlling the attitude of a tunneling machine, said machine being of the type including a movable shield and a plurality of power members for moving said shield, said method comprising the steps of:

irradiating a light beam from a stationary position in a direction substantially parallel to the intended direction of tunneling;

detecting said light beam at a location on said machine to detect deviations of the direction of shield travel relative to said light beam and generating signals corresponding to the deviation detected;

visibly indicating the deviation position in response to said generated signals;

providing a control member connected to actuating means for said power members and which actuates a portion of said power members in accordance with the orientation of a preselected non-uniform pattern of energy transmitting means carried by said control member;

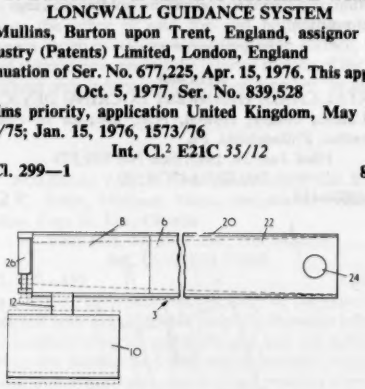
moving said control member to align a referencing index thereon with said visibly indicated deviation position and thereby reorient said non-uniform pattern of energy transmitting means to determine which of said power members are actuated.

4,111,487

UNDERGROUND MINING MACHINE WITH LONGWALL GUIDANCE SYSTEM

Rex Mullins, Burton upon Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 677,225, Apr. 15, 1976. This application Oct. 5, 1977, Ser. No. 839,528
Claims priority, application United Kingdom, May 2, 1975, 18451/75; Jan. 15, 1976, 1573/76
Int. Cl.[2] E21C *35/12*
U.S. Cl. 299—1 **8 Claims**



1. Underground mining equipment for traversing to and fro along a horizontal defined path extending along a generally vertical rock face, comprising a first part adapted to be guided along the defined path, a second part at least a portion of which is relatively movable with respect to the first part in a direction

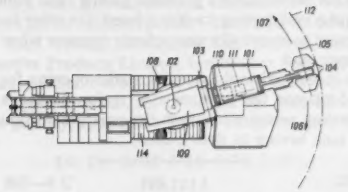
transverse to the rock face, a cutter carrying unit fixedly attached to the second part and a rotary cutter drum rotatably mounted on the second part and means mounted on the second part and connected to the drum for rotating the drum, mechanism connected to the first and second parts for relatively moving the two parts horizontally in either direction for moving the cutter unit and second part along a preselected desired path while the first part moves along the defined path, and sensing means deriving a signal indicative of disparity between the defined and desired paths.

4,111,488

METHOD FOR CUTTING MINERALS AND CUTTING MACHINE

Siegfried Sigott; Alfred Zitz, and Herwig Wrulich, all of Zeltweg, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Sep. 1, 1976, Ser. No. 719,654
Claims priority, application Austria, Sep. 3, 1975, 6796/75
Int. Cl.[2] E21C *27/24*
U.S. Cl. 299—10 **11 Claims**



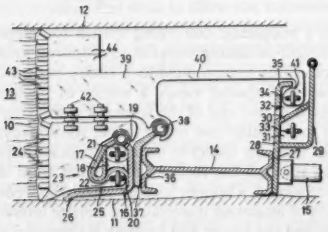
1. A method for cutting minerals from a winning face utilizing a circular cutting tool means provided with cutting teeth positioned in radial planes, said tool means rotating about an axis approximately parallel to the winning face and being moved at a feeding rate essentially in axial direction, said method characterized in that several grooves spaced-apart from each other are carved one after another in engaging sequence and that in dependence on the mineral properties the feeding rate is increased with respect to the rotary velocity when a brittle mineral is to be cut and is diminished with respect to the rotary velocity when a tough mineral is to be cut.

4,111,489

STACKED MINERAL MINING PLOWS INDEPENDENTLY DRIVEN OR COUPLED

Klaus Beckmann, and Horst Linke, both of Lünen, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Apr. 21, 1977, Ser. No. 789,407
Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621678
Int. Cl.[2] E21C *27/34*
U.S. Cl. 299—34 **8 Claims**



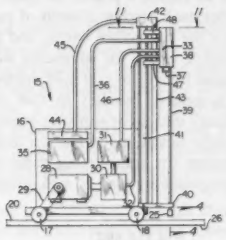
1. A mineral mining installation comprising a scraper-chain conveyor arranged alongside a mineral face, ramp-like guide means arranged at one side of the conveyor adjacent the mineral face, a main floor plough guided by said guide means for movement along the conveyor, chain drive means for driving the main plough, further guide means at the mineral face side of the conveyor and disposed nearer the center of the conveyor than the ramp-like guide means, a plough structure mounted on the main plough and separately guided with the further guide means and detachable coupling means for connecting the plough structure to the main plough.

4,111,490

METHOD AND APPARATUS FOR CHANNEL CUTTING OF HARD MATERIALS USING HIGH VELOCITY FLUID JETS

Daniel J. Liesveld, 6016 Newcombe St., Arvada, Colo. 80004

Filed Sep. 5, 1975, Ser. No. 610,577
Int. Cl.[2] E21C *25/60*
U.S. Cl. 299—17 **16 Claims**



1. Apparatus for channel cutting through a workpiece comprising:

fluid supply means for producing a fluid medium under high pressure,

a plurality of nozzles each capable of concentrating fluid introduced to an entry port thereof into a fluid column emanating from an exit orifice wherein said exit orifice is of a substantially smaller opening size than the opening size of said entry port,

means coupling the high pressure fluid medium to said entry ports of said nozzles for generating fluid flow columns from said exit orifices,

frame means for mounting said nozzles so that the flow columns thereof impinge at spaced locations on the surface of the material to be cut, the pressure of the fluid medium from said producing means being of a magnitude for erosively removing material from the workpiece in response to impingement thereon of the fluid flow column from said exit orifices including means for propelling said frame means along an intended line of cutting on the workpiece, and

reciprocating means for cyclically moving said frame means along a line perpendicular to the surface of the workpiece including means for controlling said reciprocating means to reciprocate along said perpendicular line for a distance approximately equal to the intended depth of channel cut.

4,111,491
METHOD AND APPARATUS FOR FEEDING BRISTLES IN BRUSH MAKING MACHINES

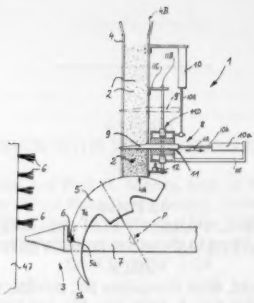
Walter Steinebrunner, Todtnau-Sonnhalde; Arthur Zahoransky, Freiburt i. Br., and Heinz Zahoransky, Todtnau, all of Fed. Rep. of Germany, assignors to Anton Zahoransky, Todtnau, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,707

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632328

Int. Cl.[2] A46D *1/04*

U.S. Cl. 300—21 38 Claims



1. In a brush making machine, the combination of a magazine arranged to store a supply of substantially parallel bristles and having an inlet and an outlet; a source of bristles including a succession of bundles each having a batch of parallel bristles and an envelope for the respective batch, and carrier means supporting said bundles; means for advancing successive bundles into said magazine by way of said inlet; means for opening the envelopes of successive bundles so that the respective batches are unconfined; means for applying pressure to unconfined batches of bristles in said magazine in a direction toward said outlet; and means for transferring tufts of compacted bristles from said magazine by way of said outlet.

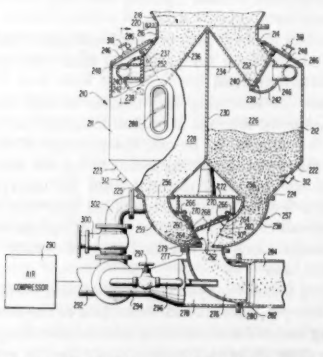
4,111,492
PNEUMATIC CONVEYING APPARATUS AND METHOD

Joseph Mraz, 501 E. Lee St., Plant City, Fla. 33566

Continuation-in-part of Ser. No. 654,796, Feb. 3, 1976, Pat. No. 4,009,912, which is a continuation-in-part of Ser. No. 520,943, Nov. 4, 1974 abandoned. This application Jan. 25, 1977, Ser. No. 762,304

Int. Cl.[2] B65G *53/36*

U.S. Cl. 302—39 14 Claims



1. Apparatus for feeding product into a pneumatic conveying system including a pipeline comprising:

a pair of storage tanks each having an opening at their upper portions for receiving product from a common supply;

each of said openings having doors;

means for alternately opening and closing said doors so that while one door is opened the other door is closed;

each of said tanks having an opening in its lower end;

a housing having two inlet openings and a single outlet opening communicating with the pipeline, means mounting said housing to the lower end of said tanks with the inlet openings of the housing in alignment with the respective openings in the lower tank ends;

said housing having first and second product channels extending from the two inlet openings to the outlet opening;

each of said product channels containing a check valve member opening into a common chamber including the outlet opening;

each of said check valve members comprising a plate-like member mounted for swinging movement about a substantially horizontal axis, said axes being substantially parallel and spaced and arranged so that the lower free end of each valve member opens to a normal position near the outer surface of the other valve member when closed;

means for introducing a pressure greater than atmospheric into the tank having its door closed, the other tank being exposed to essentially atmospheric pressure when its door is open; and

means connected to the housing outlet opening for feeding product into the pipeline at a region having a normal operating pressure less than the pressure introduced into the tank having its door closed.

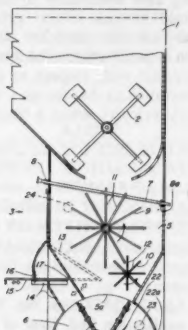
4,111,493
FEEDING APPARATUS FOR A PNEUMATIC CONVEYING SYSTEM

Henry Sperber, 8 Red Fox La., Englewood, Colo. 80110

Filed Mar. 16, 1977, Ser. No. 778,131

Int. Cl.[2] B65G *53/40*

U.S. Cl. 302—42 9 Claims



1. In a pneumatic conveying system for supplying fibrous, light-weight insulating material to a desired location wherein said conveying system includes a rotary pocket feeder having a plurality of spaced vanes, a source of pneumatic pressure connected to one end of the feeder, a conveying conduit connected to the other end of the feeder for conveying insulating material from the feeder to the desired location by means of air flowing through the feeder and conduit from the pneumatic pressure source, a hopper located above the feeder for holding a supply of insulating material, and a chute interconnecting the hopper and the feeder and forming a restricted opening along the length of the top of the feeder through which the insulating material is fed into the feeder, the improvement comprising:

first tine means rotatably mounted within the chute and

having fingers of sufficient length to extend partially into the lower portion of the hopper;

a plurality of rod members spaced across the bottom of the hopper and offset from the first tine member fingers so that said fingers can extend into the lower portion of the hopper and engage insulating material therein;

second tine means rotatably mounted within the chute adjacent the restricted opening and between said first tine means and the pocket feeder, said second tine means having fingers which are offset from said first tine means fingers and are of sufficient length to intermesh therewith; and

means connected to said first and second tine means to rotate them in the same direction so that said fingers of said first tine means pull insulating material from the hopper through said rod members down into the chute in the vicinity of said second tine means whereupon the fingers of said second tine means pull the insulating material off of the fingers of the first tine means within the chute and down through the restricted opening into the pocket feeder.

4,111,494

VEHICLE BRAKING SYSTEM INCLUDING VALVES FOR BRAKING MODULATION DURING CORNERING

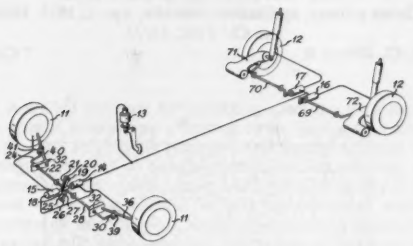
Alastair John Young, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Continuation of Ser. No. 544,490, Jan. 27, 1975, abandoned. This application Jul. 28, 1976, Ser. No. 709,607

Claims priority, application United Kingdom, Jan. 28, 1974, 3935/74

Int. Cl.[2] B60T *8/18, 8/24, 8/26*

U.S. Cl. 303—6 C **20 Claims**



1. A fluid pressure braking system for a vehicle including a driver-controlled source of liquid pressure, a first liquid pressure control device for controlling the pressure that is exerted to apply a brake to a first front wheel of the vehicle which is on one side of the vehicle, a second liquid pressure control device for controlling the pressure that is exerted to apply a brake to a second front wheel of the vehicle which is on the other side of the vehicle, each liquid pressure control device comprising a valve member and a valve seat with which said valve member co-operates, and control means for each liquid pressure control device, the control means being operable to exert a biassing load which acts to separate each valve member and the respective valve seat so as to allow the transmission of liquid pressure from said source through the space between the valve member and the valve seat of each liquid pressure control device, the valve member and the associated valve seat of each liquid pressure control device being so arranged that the action of the biassing load exerted by the respective control means is opposed by the action of liquid pressure which is exerted to apply the brake to the respective wheel so that the respective valve member seats upon its associated valve seat when that liquid pressure reaches a level which is dependent upon the respective applied biassing load, the control means being operable to change either biassing load in response to conditions which indicate that the load supported by the respective wheel is reduced so that any pressure which is exerted to apply the brake to the other of said first and second wheels is higher than any pressure which is exerted to apply the brake to the said respective wheel, wherein the biassing load which acts to separate each valve member and the respective valve seat is sufficient to hold the valve member and the valve seat of each of said liquid pressure control devices separated if the control means sense conditions which indicate that the two front wheels support substantially identical loads so that the pressure exerted to apply the brakes to both said front wheels is not varied from the pressure that is transmitted by the driver-controlled source of liquid pressure.

4,111,495

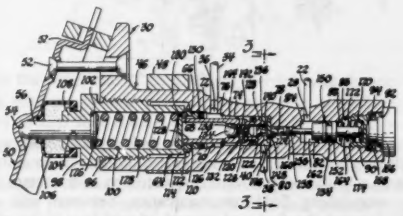
LOAD SENSING PROPORTIONER WITH PROPORTIONER DELAY

Denny L. Peeples, New Carlisle, Ohio

Filed Jun. 29, 1977, Ser. No. 810,972

Int. Cl.[2] B60T *8/00, 8/18*

U.S. Cl. 303—6 C **1 Claim**



1. In a brake pressure circuit proportioner having

a housing having first and second pressure receiving ports respectively capable of receiving pressure from first and second brake pressure circuits for actuating first and second brakes, a pressure outlet port for delivering brake actuating pressure to the first brake, a proportioning piston and a proportioning valve positioned fluidly intermediate said first pressure receiving port and said outlet port, said valve being normally open to allow substantially uninhibited pressure therethrough from said first port to said outlet port, said piston acting upon a pressure increase to a first predetermined first port pressure to move relative to said valve to close said valve and thereafter proportion pressure at a predetermined ratio from said first port to said outlet port as pressure further increases at said first port, the improvement comprising:

a movable seat engaged by said proportioning piston and said valve when said valve is normally open, and disengaged from said proportioning piston when pressure is being proportioned; a spring-biased proportioning delay piston normally biased to an inactive position by pressure in said second port but moved under the spring-bias force upon loss of pressure in said second port and operatively engaging said valve and said proportioning piston through said seat to move said valve concurrently with said proportioning piston when and as said proportioning piston moves, keeping said valve normally open and continuing to allow substantially uninhibited pressure therethrough from said first port to said outlet port until pressure at said outlet port acting on said proportioning delay piston reaches a second predetermined first port pressure and overcomes the spring-bias force acting on said proportioning delay piston and moves it operatively away from said valve and said proportioning piston and said seat, permitting said valve to move said seat relative to said proportioning piston to close said valve and institute proportioning action, said second predetermined first port pressure being sufficiently greater than said first predetermined first port pressure to assure a substantially higher level of

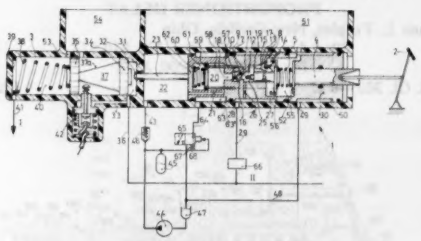
first brake actuating pressure before proportioning begins when there is no second brake actuating pressure.

4,111,496

HYDRAULIC BRAKE BOOSTER

Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 25, 1977, Ser. No. 772,208
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1976, 2609904
Int. Cl.[2] B60T *17/18, 13/14*
U.S. Cl. 303—92 **3 Claims**



1. In a master brake cylinder for two-circuit braking systems including a housing, a control piston sliding within an booster piston, a brake control valve, actuated by said control piston, for establishing fluid communication between said master cylinder and the first and second of said two brake circuits, said control piston having means for engaging and carrying along said booster piston after a predetermined amount of axial travel, and including a second main cylinder and piston for said second braking circuit,

the improvement wherein said control piston includes an annular chamber which is in communication with a line leading to a 3/2-way valve, said 3/2-way valve being constructed to control flow between said annular chamber, a storage source and a pressure reservoir, whereby pressure on said control piston can be interrupted upon pressure failure.

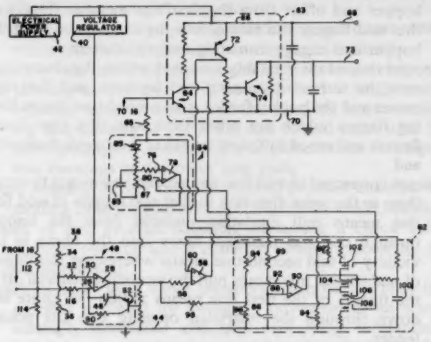
4,111,497

PRESSURE COMMAND GENERATOR WITH INITIAL CONDITION LOGIC FOR ADAPTIVE BRAKING SYSTEM

Ralph W. Carp; Leoncio T. Ang, both of Newport News, Va., and Guy T. Rini, North Ridgeville, Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 16, 1977, Ser. No. 807,284
Int. Cl.[2] B60T *8/00*
U.S. Cl. 303—110 **10 Claims**

1. In a vehicle having a wheel, a brake controlling said wheel, and fluid pressure responsive means for actuating said brake, an adaptive braking system controlling communication to said fluid pressure responsive means comprising speed sensing means for generating a speed signal as a function of the rotational velocity of said vehicle wheel, modulator means for controlling the fluid pressure level communicated to the fluid pressure responsive means, and logic means responsive to said speed signal for generating a signal controlling said modulator means, said logic means including pressure command generating means for generating a pressure command signal representing the desired fluid pressure level in said pressure responsive means, and means for setting the initial value of said pressure command signal including an initial condition control signal generating means including a comparator for comparing said fixed reference signal with said signal controlling the modulator to generate said initial condition control signal when the fixed reference signal and the signal controlling the modulator are in a predetermined relationship with one another, and means associated with the pressure command generating means responsive to the initial condition control signal to cause



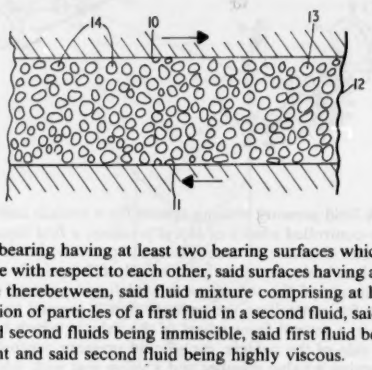
the pressure command generating means to generate the pressure command signal.

4,111,498

BEARINGS

Robert Eric Miller, 2 Ian Street, Rose Bay, New South Wales 2029, Australia

Filed Mar. 26, 1976, Ser. No. 670,783
Claims priority, application Australia, Apr. 2, 1975, 1080/75
Int. Cl.[2] F16C *33/12*
U.S. Cl. 308—5 R **7 Claims**



1. A bearing having at least two bearing surfaces which are movable with respect to each other, said surfaces having a fluid mixture therebetween, said fluid mixture comprising at least a suspension of particles of a first fluid in a second fluid, said first and said second fluids being immiscible, said first fluid being a lubricant and said second fluid being highly viscous.

4,111,499

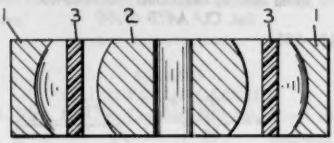
BEARING ASSEMBLY AND LINER

Albert R. McCloskey, Fairfield, Conn., assignor to The Heim Universal Corporation, Fairfield, Conn.

Continuation of Ser. No. 563,569, Mar. 31, 1975, abandoned. This application Dec. 2, 1976, Ser. No. 746,752
Int. Cl.[2] F16C *23/00*
U.S. Cl. 308—72 **10 Claims**

1. A bearing liner adapted for extreme temperature applications comprising a resin matrix selected from the group consisting of a polyimide resin matrix and a polybutadiene resin ma-

trix having included therein a random dispersion of polytetrafluorethylene particles, said resin matrix adhered to a backing



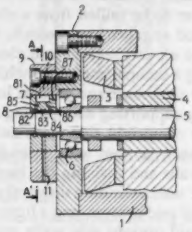
material, thereby providing a bearing liner having an extensive operating temperature range.

4,111,500

SEALING STRUCTURE FOR A BEARING

Shigenori Ando, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Japan

Filed Mar. 30, 1977, Ser. No. 782,966
Claims priority, application Japan, Mar. 31, 1976, 51-35580
Int. Cl.[2] F16C *33/74*
U.S. Cl. 308—187 **4 Claims**



1. A sealing structure for protecting a bearing for a journal of a spindle, comprising a bearing cover having an opening that receives and closely surrounds said journal adjacent said bearing, a plurality of annular recesses in said opening, said recesses surrounding said journal and opening inwardly to said journal, an annular channel in said bearing cover radially outwardly of said opening, means for supplying pressurized lubricating fluid to said channel, first passage means from said channel to said bearing to supply said pressurized lubricating fluid to said bearing, second passage means connecting said channel to at least one of said recesses, and an exhaust opening for exhausting said pressurized lubricating fluid from at least one other of said recesses to thereby carry off any impurities entering between said journal and said opening.

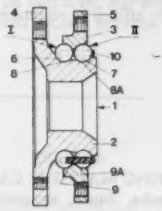
4,111,501

BEARING CAGE

Gordon Boyd Johnston, Beesd, Netherlands, and Hasse Eivind Strandberg, Floda, Sweden, assignors to SKF Industrial Trading & Development Co., B.V., Nieuwegein, Netherlands

Division of Ser. No. 759,036, Jan. 13, 1977, abandoned, which is a continuation of Ser. No. 545,893, Jan. 31, 1975, Pat. No. 4,004,840. This application Nov. 21, 1977, Ser. No. 853,506
Claims priority, application Netherlands, Feb. 6, 1974, 7401604
Int. Cl.[2] F16C *33/46*
U.S. Cl. 308—201 **3 Claims**

1. In a bearing having an inner race ring and an outer race ring about a common central axis, two circular rows of rolling elements positioned to roll between said rings in raceways in said rings, said two rows defining first and second planes axially spaced along said axis, and a bearing cage insertable axially from one side of said bearing, said cage including holding means for positioning each rolling element of one row adjacent one rolling element of the second row as an axially aligned pair, and for positioning said pairs circumferentially around said raceways, the improvement in combination therewith, wherein said bearing cage comprises an annular, unitary member of a flexible and elastic material having circumferentially spaced U-shaped pockets, each with an axially extending recess which is closed at one end and open at the other end, and a partition between and connecting each two adjacent pockets, and extending from the open end of each pocket a pair of snap-fingers extending generally axially and partially converging, each pocket and associated snap-fingers forming one of said holding means for one of said pairs of rolling elements, each pocket holding a first rolling element of each pair axially



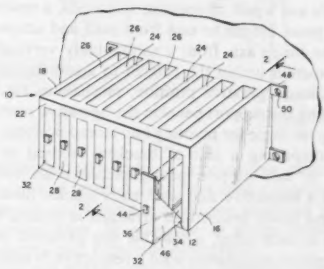
fixed in the closet end of the U-shape thereof, with the second rolling element of said pair axially movable in said recess relative to said first rolling element, and said snap-fingers of said pocket defining a limit of axial movement of said second rolling element only in the direction away from the first rolling element, each of said partitions comprising axially spaced first and second parts generally near said first and second planes with an aperture defined between said parts and adjacent pockets, whereby said cage is elastically deformable in the radial direction and said rolling elements in each of said pairs, as well as rolling elements in adjacent rows, may move relative to each other.

4,111,502

AUTOMOBILE TAPE STORAGE CASE

Harvey Kessler, 72 Cedar Rd., Westbury, N.Y. 11590

Filed Aug. 24, 1976, Ser. No. 717,226
Int. Cl.[2] A47B *81/06*; B65D *39/00*
U.S. Cl. 312—10 **5 Claims**



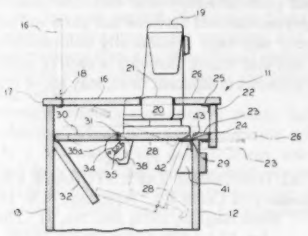
1. An automobile tape storage case adapted to receive a plurality of tape cartridges or cassettes therein and to be mounted onto the automobile, which comprises:

(a) a housing having a base, a pair of upwardly extending end walls, an upwardly extending rear wall, an open top, and an upwardly extending front wall having a plurality of openings therethrough;

(b) a plurality of spaced intermediate walls disposed within said housing and aligned parallel to said end walls for forming a plurality of chambers with said housing, each said chamber communicating with one of said opening in said front wall;

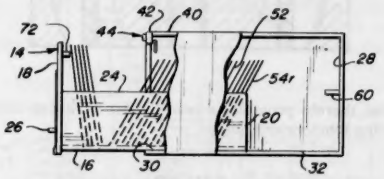
(c) a plurality of drawer members, each said drawer member slidably disposed in one of said chambers;
(d) means for mounting said housing to said automobile;
(e) means for retaining each said drawer within each said opening, each said drawer adapted to receive one tape cartridge or cassette therein and wherein each said drawer comprises:
(f) an elongated base having a pair of ends;
(g) a front wall extending perpendicularly upwardly from said forward end of said elongated base; and
(h) an L-shaped rear wall having a longer and a shorter leg, said shorter leg being slidably disposed on an upper surface of said base, said rear end of said elongated base being perpendicularly affixed to an intermediate portion of said longer leg.

4,111,503
SEWING MACHINE CABINET
Tadao Kohara, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan
Filed Jun. 20, 1977, Ser. No. 807,966
Claims priority, application Japan, Jul. 2, 1976, 51-88638; Aug. 12, 1976, 51-108725
Int. Cl.[2] D05B 75/00
U.S. Cl. 312—27 **6 Claims**



1. In a sewing machine cabinet a frame including front and rear walls and a pair of opposite side walls, a sewing machine support panel hinged to said front wall and adapted to pivot about the hinge axis from a substantially vertically inclined stored position within the cabinet to a substantially horizontally inclined operative position, mechanism for supporting and locking the support panel in the operative position and for releasing the same for pivoting into stored position, said mechanism comprising a pair of brackets secured in depending relation to said support panel, each bracket being located adjacent a respective side wall, each bracket having opposed upper and lower projections arranged in spaced confronting relation to each other, a roatable dog mounted on each side wall in planar registration with a respective bracket, each dog being substantially rectangular in shape and having a notch in each end edge, said upper projection when the support panel is in secured operative position being engaged in an upwardly disposed notch with a side of said notch being disposed in over center position and bearing against an outer edge of said upper projection, said lower projection when said support panel is rocked upwardly from the operative position engaging a lower edge portion of said dog to rock said dog to a position whereby upon the downward movement of said support panel the upper projection will rock the dog so that it assumes a position out of the path of movement of the upper projection thereby freeing the support panel for movement to a stored position within the cabinet.

4,111,504
STORAGE FILE AND RETRIEVAL SYSTEM
Esteban Montiel, 744 Yates, Romeoville, Ill. 60441
Filed Jun. 6, 1977, Ser. No. 803,635
Int. Cl.[2] A47B 63/00
U.S. Cl. 312—183 **1 Claim**



1. A storage file and retrieval system, comprising:
a drawer having a bottom, end walls extending upwardly from said bottom including a front wall and a back wall, a pair of elongated side walls extending between said end walls and a handle attached to said front wall for permitting said drawer to be pulled from a closed position to a partially opened engagement position, to a fully opened position and be moved back to said closed position;
a cabinet defining a compartment into which a drawer slides and having an undercarriage with at least one elongated rail for slidably supporting and guiding the bottom of said drawer, a pair of upright side walls defining the sides of the compartment, a rear wall extending between said upright side walls and defining the back of the compartment, said rear wall extending upwardly to a height above the back wall of said drawer, and a front face plate extending between said upright side walls and positioned adjacent the front wall of said drawer when said drawer is in a closed position and defining an elongated lateral slot;
index folder means including a plurality of file folders disposed generally vertically in side-by-side relationship laterally across said drawer between said elongated side walls for storing and separating papers and tab means extending upwardly from each of said file folders, said tab means each having a striker face disposed generally in a different striker location;
said front face plate having indicia thereon adjacent said slot and corresponding to said striker faces of said tab means and the locations of said file folders;
reset means connected to said cabinet for engaging said index folder means and causing said file folders to tilt toward the front wall of the drawer when said drawer is closed, said reset means including an elongated bar cantilevered from the rear wall of the cabinet and extending longitudinally into the interior of said cabinet above and forwardly of the back wall of the drawer when said drawer is in said closed position; and
movable selector means including a pin for sliding along said slot, handle means for grasping said pin and for permitting said selector means to be selectively moved, said handle means defining indicator means for indicating the particular indicia on said front face plate and a striker arm extending downwardly from said pin means within the interior of the cabinet to a level in general horizontal alignment with said striker faces of said tab means, said selector means being movable to a plurality of positions with each position corresponding to one of said indicia to indicate when said striker arm is aligned in registration with a striker face of said tab means so that when said drawer is moved to said partially opened engagement position and subsequently moved to said fully opened position said striker arm will abuttingly engage and push against said corresponding striker face of one of said file folders and cause said one file folder and the other file folders disposed between said one file folder and said back wall of said

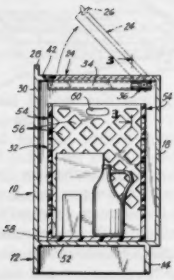
drawer to tilt toward the back wall of the drawer and be separated and angularly displaced from the remaining folders between said one folder and the front wall of said drawer.

4,111,505

CHILD-PROOF CABINET

George A. Vice, 105C E. Crooked Hill Rd., Pearl River, N.Y. 10965

Continuation-in-part of Ser. No. 661,369, Feb. 25, 1976, Pat. No. 4,008,934. This application Feb. 14, 1977, Ser. No. 768,339
Int. Cl.[2] A47B *81/00, 95/02*
U.S. Cl. 312—209 28 Claims



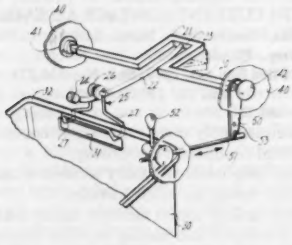
1. A cabinet comprising an enclosure defining an interior cavity, said enclosure comprising
a rearmost vertical wall,
a substantially horizontal surface having an opening defined therein for access to said cavity,
a substantially integrally formed frontmost wall adjacent to said surface,
a container having an open mouth at one end thereof,
said container being removably disposed within said cavity,
a cover for said opening and means for movably fastening said cover to said surface for effectively covering and uncovering said opening, said last mentioned means including means for exposing said opening by the movement of said cover in the general direction of said frontmost wall and into coextensively disposed parallel planar position adjacent thereto and said opening being covered by the movement of said cover in the general direction away from said frontmost wall and toward said rearmost vertical wall.

4,111,506

TILTING HANGER APPARATUS

Mitchell F. Gorkiewicz, 619 E. 6th St., Royal Oak, Mich. 48067

Filed Jul. 1, 1977, Ser. No. 812,175
Int. Cl.[2] A47B *81/00*
U.S. Cl. 312—211 5 Claims



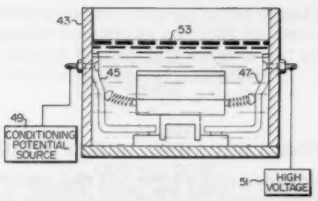
1. Apparatus for extending a container from a housing for use and for retracting a container into a housing for storage, comprising,
a rail having an outer end and an inner end;
a trolley rollable on said rail for carrying a container; and
means mountable on a housing tiltably supporting said rail between a first position inclining downwardly-outwardly to roll said trolley to said outer end of said rail to carry a container to a use position outwardly of a housing and a second position inclining downwardly-inwardly to roll said trolley to said inner end of said rail to carry a container to a storage position inwardly of a housing, said means comprising a shaft, means pivotally mounting said shaft, a crank-arm on said shaft, and stop means for limiting crank-arm angular motion between two points.

4,111,507

APPARATUS FOR HIGH VOLTAGE CONDITIONING CATHODE RAY TUBES

Ralph E. Neuber, and Charles H. Rehkopf, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 13, 1977, Ser. No. 796,744
Int. Cl.[2] H01J *9/44*
U.S. Cl. 316—27 10 Claims



1. Apparatus for high voltage conditioning cathode ray tubes having spaced internal electrodes each connected to an external base pin and having a resistance to arcing between electrodes greater than the resistance to arcing between the external base pins, said apparatus comprising:
high voltage and pulsed conditioning potential sources;
a container;
a pair of electrical contact members affixed to and passing through said container, one of said pair of electrical contact members being connected to each one of said high voltage and pulsed conditioning potential sources;
means within said container coupled to said pair of electrical contact members for connecting said electrical contact members to said external base pins of said cathode ray tube; and
a liquid having a dielectric strength greater than the dielectric strength of air disposed within said container and surrounding said means for connecting said electrical contact members to said external base pins of said cathode ray tube.

4,111,508

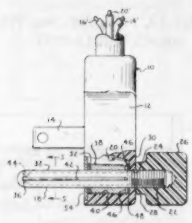
Patent Not Issued For This Number

4,111,509

ELECTRIC PLUG LOCK MEANS

John Novak, 1533 W. 52nd Pl., Merrillville, Ind. 46410

Filed Sep. 29, 1977, Ser. No. 837,696
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 P 5 Claims



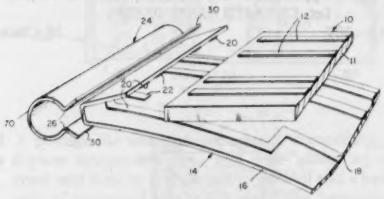
1. In an electrical plug wherein said plug comprises a body having electric contact blade members extending therefrom, a ground post extending from said body, said ground post and said electrical contact blades adapted for insertion in an electric receptacle, and said plug body having electric conducting wires so that the ends of said wires connect to said electric contact blades and said ground post, the improvement comprising: said plug body having a hole therethrough, a portion thereof being enlarged; said ground post extending through said hole, said ground post being formed with a longitudinal groove; a filament member in said groove, said filament member having one end upended to radially extend out of the groove and the other end angled to seat in the groove at the distal end of said post; a bushing member seated in the enlarged portion of said hole in said plug body circumferentially supporting said post in said hole; means between said bushing member and said plug body for contacting the upended end of said filament member and the ground wire, said bushing member abutting the upended end of said filament member against said means connecting said ground wires; and a knob member connected to the end of said ground post extending through said plug body for longitudinally shifting said ground post to radially flex said filament member out of said groove.

4,111,510

FLEXIBLE CIRCUIT/FLAT CABLE TO CIRCUIT BOARD EDGE CONNECTOR FOR ELECTRONIC WRIST WATCHES, CALCULATORS AND THE LIKE

Rudolf F. Zurcher, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 653,320, Jan. 29, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,370
Int. Cl.[2] H05K *1/12*
U.S. Cl. 339—17 F 11 Claims



1. An electrical coupling mechanism for use in electronic devices including watches, calculators, combinations thereof, and the like, adapted for wear on a wearer's person comprising a stiff electrical termination, flexible electric circuitry adapted to be coupled thereto, and including elastomeric dielectric insulation, each said termination and said circuitry having bared conductive material thereon, a substantially rigid elongated clip of resilient material having a generally C-shaped cross-sectional configuration and including means for guiding said flexible circuitry around the termination, for bringing the respective bared conductive materials of the flexible circuitry and the termination into electrical contact, for exerting substantially straight-line pressure on said electric circuitry and thereby for mechanically clamping the flexible circuitry and the termination together, said elastomeric dielectric insulation serving as a local equalizer of any thickness variations between said electric circuitry and said termination, and bevelled sides on said clip for acting at least as said guiding means and for enabling said clip to be engaged with said circuitry and said stiff termination in an edgewise sliding manner.

4,111,511

HIGH CURRENT CONTACT ASSEMBLY

Philip C. Bolin, Westborough, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 23, 1977, Ser. No. 836,171
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—64 R 7 Claims

1. A contact assembly for electrically connecting first and second electrical conductors comprising:

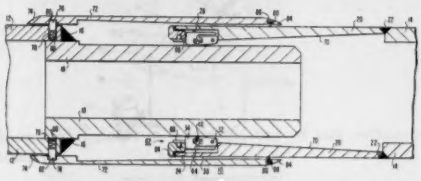
a cylindrical plug member fixedly secured to said first conductor and having an outer diameter;

a cylindrical, hollow socket member fixedly secured to said second conductor and having an inner diameter greater than said plug member outer diameter, said socket member receiving said plug member therein, said socket member having an annular recess therein;

a plurality of contact fingers disposed within said recess and seated against a radial surface of said socket member;

an annular holder disposed within said recess axially spaced from said contact fingers, said holder having an annular axial projection therefrom extending axially adjacent said contact fingers radially outwardly therefrom, said holder projection being radially spaced apart from said socket member, said holder projection and said socket member forming an annular space therebetween;

resilient biasing means disposed intermediate said contact



fingers and said holder and acting upon each of said contact fingers; and

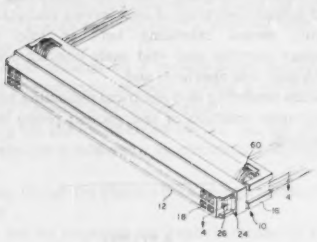
means connected to said socket member and physically contacting said holder for loading said biasing means so as to produce a force upon said contact fingers, said force having a component in the radial direction and a larger component in the axial direction, said radial component producing contact pressure between each of said fingers and said plug member and said axial component producing contact pressure between said fingers and said socket member surface.

4,111,512

STRAIN RELIEF COVER FOR FLAT FLEXIBLE CABLE CONNECTOR

Kenneth Ronald Parmer, and David Murray Little, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 13, 1977, Ser. No. 805,958
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—105 **5 Claims**



1. An electrical connector for terminating multiple conductor flat flexible cable, said connector comprising:

a contact housing having a mating face, a cable engaging face, a plurality of contact passages extending between said faces, and latching means;

a like plurality of electrical contacts each mounted in a respective one of said contact passages with a matable portion adjacent said mating face and an insulation displacing conductor engaging portion extending from said cable engaging face, said insulation displacing conductor engaging portion comprising a pair of parallel spaced tines defining a slot therebetween and outwardly directed latching shoulders on the free end of each tine;

a cover and strain relief member having a cable supporting face with a like plurality of profiled contact receiving passages extending therein each defining a latching shoulder parallel to and spaced inwardly from said cable supporting face, cable passage parallel to and spaced from said face, and latching means cooperating with the latching means of said contact housing, whereby a cable follows a tortuous path through the passage and around to the supporting face where it is terminated and thus a strain relief function is provided.

4,111,513

CABLE-CONNECTOR BACKSHELL ADAPTER DEVICE

Bruce E. Thurston, Parlin; Albert H. Owens, Sparta, and Powell J. Pocsi, Warren, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 22, 1977, Ser. No. 835,548
Int. Cl.[2] H01R *3/06, 13/46*
U.S. Cl. 339—143 R **5 Claims**

1. A cable-connector backshell adapter device which comprises:

a base backshell adapter member having a circularly shaped internally threaded open bottom end which has a pin bore transversely positioned therethrough, a base top open end having a peripheral integral flange adjacent to said top open end, said base top open end further including a plurality of radially disposed lead shield solder grooves passing therethrough, and a semicircular tubularly shaped base cable bottom support section extending in a direction normal to a longitudinal axis of said base open bottom end; and

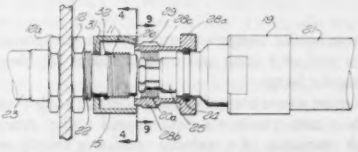
cover means operatively disposed on top of said base backshell adapter member, for providing mechanical support for a shielded braided cable assembly and providing a solder area for said shielded braided cable.

4,111,514

POLARIZING KEYING DEVICE FOR ELECTRICAL CONNECTORS

Alexander R. Brishka, Irvine, and David W. DeChamp, Westminster, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 23, 1977, Ser. No. 809,412
Int. Cl.[2] H01R *13/64*
U.S. Cl. 339—186 R **2 Claims**



1. A device for discretely keying first and second matable connectors to prevent unintended mismating where a plurality of such connectors are located in the same vicinity, said first matable connector including a first body shell with first exter-

nal surface engagement means and said second matable connector including a rotatable captive second body shell extending axially over said first body shell during mating of said connectors, said second body shell including second engagement means on the inside surface thereof for securing said first and second connectors in the mated position, comprising:

first means comprising a plurality of axial grooves within the external surface of said second body shell, said grooves having a discrete predetermined circumferential spacing;

an annular channel within the external surface of said second body shell behind said grooves;

second means comprising a key member surrounding and rotatable relative to said first body shell, said key member having an inside diameter greater than the outside diameter of said second body shell and a plurality of radially inwardly directed keys at the front of said key member spaced to correspond to said axial grooves in said second body shell and to engage said grooves when said connectors are mated and to prevent axial mating of said connectors if said grooves and keys do not correspond for at least one rotational relationship between said second body shell and said key member;

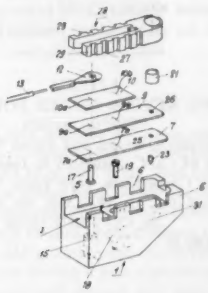
means for restricting rotation of said key member relative to said first body shell; and

said keys being positioned in said channel during mating of said first and second connectors to allow rotation of said second body shell relative to said first body shell.

4,111,515
LAMP HOLDER FOR TWIN-SOCKET TYPE HALOGEN LAMPS

Jurg Nigg, Beckenhofstrasse 30, 8006 Zurich, Switzerland

Filed Sep. 3, 1976, Ser. No. 720,322
Claims priority, application Switzerland, Sep. 12, 1975, 11861/75
Int. Cl.[2] H01R *13/00*
U.S. Cl. 339—112 R **13 Claims**



1. A lamp holder, comprising socket means for receiving and holding a part of a lamp and contact means for electrically contacting the lamp;

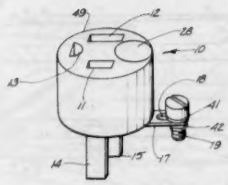
said contact means comprising a contacting knob engageable with a lamp conductor held in said socket means; said knob consisting of a material consisting mainly of silver and the remainder of a minor portion of nickel; terminal means electrically connected to said contacting knob;

said socket means being comprised of ceramic material; said socket means supporting said contacting knob and a lamp conductor.

4,111,516
GROUND AND POLARITY MONITORING APPARATUS INCLUDING MEANS TO CORRECT IMPROPER POLARITY

Wallace H. Wireman, 13 Park Ave., Walton, Ky. 41094

Continuation-in-part of Ser. No. 592,725, Jul. 3, 1975, abandoned. This application Mar. 22, 1976, Ser. No. 669,187
Int. Cl.[2] H01R *3/00*
U.S. Cl. 339—113 R **10 Claims**



1. A ground fault indicating and polarity correcting adapter for use with a polarized electrical service receptacle of the type having normally hot and normally neutral service terminals and at least one normally grounded connection, said adapter comprising:

(a) a housing having first, second and third apertures spatially arranged and configured to receive respectively, the hot, neutral and ground prongs of a polarized three prong electrical plug;

(b) two male contacts extending from said housing and reversibly insertable in said hot and neutral service terminals, said male contacts communicating with said first and second apertures for conductively engaging said hot and neutral prongs upon insertion of said plug into said housing;

(c) a supplemental contact member adjustably extending from said housing for engaging said ground connection and communicating with said third aperture for conductively engaging said ground prong upon insertion of said plug into said housing;

(d) electrical indicating means for indicating both ground and polarity integrity of said service receptacle, said indicating means extending between said supplemental contact member and said male contact communicating with said first aperture; and

(e) means rendering said electrical indicating means operable only upon insertion of said ground prong into said third aperture.

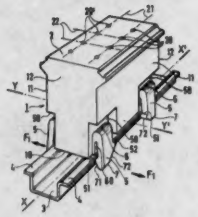
4,111,517
JUNCTION BLOCK WITH TWO FIXING ORIENTATIONS

Jean Debaigt, Maisons Laffitte, France, assignor to Cgee Alsthom, Levallois-Perret, France

Filed Sep. 29, 1977, Ser. No. 837,979
Claims priority, application France, Oct. 15, 1976, 76 31142
Int. Cl.[2] H01R *9/22*
U.S. Cl. 339—198 GA **8 Claims**

1. A junction block having two orthogonal fixing orientations in relation to a support having parallel strip edges, each block comprising; a molding of plastics material including four resilient fixing legs integrally molded with the block and disposed symmetrically in pairs about both of the fixing orientations of the block, each leg being so configured and having two lock notches which face, respectively, the adjacent fixing legs, each one of said two lock notches on each leg facing a different one of the adjacent legs for movement of either one of said two lock notches on each leg under one of the edges of the support

after resilient flexure away from said edge during pressure application of the block to the support to thereby retain said



block on said support in a selected one of said orthogonal orientations.

4,111,518

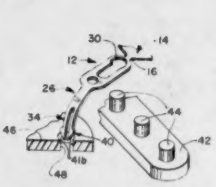
QUICK CONNECT AND NON-DESTRUCTIVE DISCONNECT ELECTRICAL WIRING-CONNECTOR DEVICE

Rudolf F. Zurcher, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 608,434, Aug. 28, 1975, abandoned. This application Mar. 25, 1977, Ser. No. 781,083

Int. Cl.[2] H01R *13/06*

U.S. Cl. 339—252 R **1 Claim**



1. A method for electrically connecting means for defining a hole lined with electrically conductive material with a lead, comprising the steps of:

providing a tab secured by a necked-down portion to an electrically conductive element having a tail and means therein for defining a key-hole opening;

manipulating the tab for inserting the tail into the lined hole and thereby for establishing an electrical coupling therebetween;

manipulating the tab for placing the key-hole means over the lead; and

pulling the tab for engaging the keyhole means by interference fit with the lead and thereafter for separating the tab from the electrically conductive element.

4,111,519

RECORDING AND READING SYNTHETIC HOLOGRAMS

Alva Knox Gillis, Melbourne; Thomas Harvey Otten, and Andrew Miklos Bardos, both of Indian Harbour Beach, all of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Mar. 10, 1976, Ser. No. 665,720

Int. Cl.[2] G02B *27/00*

U.S. Cl. 350—3.66 **18 Claims**

1. Apparatus for recording a Fourier transform hologram of a multibit byte of binary data comprising:

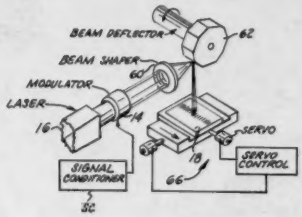
means for providing a time varying analog electrical signal representative of a Fourier transform of a multibit byte of binary data,

photosensitive recording means capable of recording an intensity modulated pattern of coherent light and having a nonlinear transmittance versus exposure characteristic;

means for providing a beam of coherent light;

means for scanning said beam transversely of its direction of propagation across said recording means;

means responsive to said analog electrical signal for intensity modulating said beam as it is scanned across said recording means so as to thereby record a Fourier transform hologram of said byte of data;



said analog electrical signal providing means including compensating means for causing nonlinear variations in the magnitude of said analog electrical signal affecting the intensity modulation of said coherent light to compensate for nonlinear response characteristics of said modulating means to said analog electrical signal and for said nonlinear characteristic of said recording means whereby the transmittance of said recording means linearly corresponds to the value of said analog electrical signal.

4,111,520

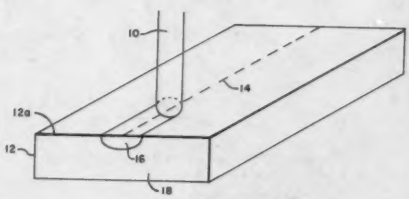
FABRICATION OF OPTICAL WAVEGUIDES

Enrique Bernal G., Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 13, 1975, Ser. No. 540,920

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.12 **3 Claims**

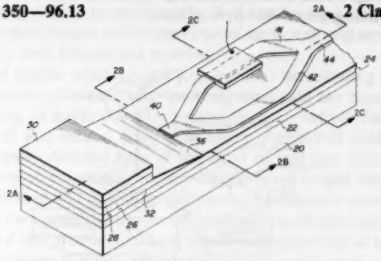


1. A surface optical waveguide comprising a body of optical material having substrate and surface waveguide regions, the upper surface of the waveguide region being substantially coplanar with a major surface of the material so that the waveguide region extends downwardly from said major surface, the substrate region having a first index of refraction and the surface waveguide region having a second index of refraction, the second index of refraction being greater than the first index of refraction as a result of residual stress within the waveguide region created by laser beam heating of the surface waveguide region, said heating being sufficient to cause plastic deformation within the surface waveguide region, but not sufficient to cause evaportion of the material.

4,111,521
SEMICONDUCTOR LIGHT REFLECTOR/LIGHT TRANSMITTER

William Streifer, Palo Alto; Donald R. Scifres, and Robert D. Burnham, both of Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1977, Ser. No. 761,105
Int. Cl.[2] G02B 5/14; H01S 3/10
U.S. Cl. 350—96.13 2 Claims

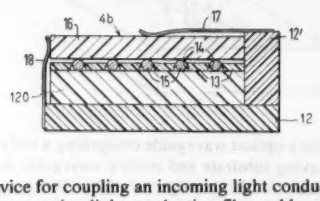


1. A semiconductor body including:
a solid state laser cavity defined by an active region boarded by a rectifying junction and a pair of light feedback means,
one of said light feedback means including a first elongated light guiding region and a second elongated light guiding region, said first and second elongated light guiding regions originating from a first common region and terminating at a second common region,
first means for forward biasing said rectifying junction to produce light output from said active region,
second means for guiding the light output of said active region into said first common region whereby portions of said light output are guided between said first and second common regions via said first and second elongated regions, and
third means for regulating the relative phase of the light traveling in said first and second elongated regions to provide, depending on said relative phase, total or partial light reflection at said second common region.

4,111,522
DEVICE FOR COUPLING TWO LIGHT CONDUCTING FIBER CABLES

Franz Auracher; Karl-Heinz Zeitler, and Walter Rauscher, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 21, 1976, Ser. No. 688,716
Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522740
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 12 Claims

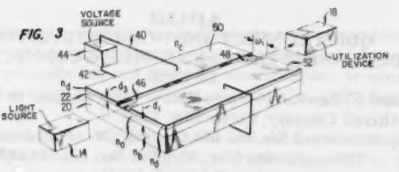


1. A device for coupling an incoming light conducting fiber cable to an outgoing light conducting fiber cable, said device comprising at least one housing, and means secured in the housing for holding the end faces of the light conducting fibers of each cable in a centered relationship to each other and for optically interconnecting the end faces of the light conducting fibers of the incoming cable to the end faces of the light conducting fibers of the outgoing cable, said means including at least one holder having a guide body with a pair of spaced edges with a first surface extending therebetween, said guide body having a plurality of parallel guide channels for the light conducting fibers extending inward from said first surface of the body and between said spaced edges, each of said guide channels having a cross section with an undercut profile so that the width of the channel increases as the distance that the channel extends inward from the first surface increases, and a cover member disposed on the first surface of the guide body to close off the guide channels so that the light guiding fibers disposed in the channels are held therein.

4,111,523
THIN FILM OPTICAL WAVEGUIDE

Ivan Paul Kaminow, Tinton Falls, and Herwig Werner Kogelnik, Fair Haven, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 381,985, Jul. 23, 1973, Pat. No. 3,990,775.
This application Aug. 3, 1976, Ser. No. 711,319
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.14 6 Claims



1. In combination, a substrate, a planar dielectric thin-film waveguiding layer disposed on said substrate, said waveguiding layer having an index of refraction that is greater than the index of refraction of said substrate, and passive means for defining in said layer in the absence of an applied electric field a region having an effective index of refraction that is higher than that in the other regions of said layer, said passive means comprising only two spaced-apart longitudinal elements disposed in contact with one surface of said layer for defining in the portion of said layer between said elements a portion to which optical waveguiding is limited, said elements each having a complex index of refraction n_d where

$$n_d^2 = A + iB,$$

A being a negative real number, $i = \sqrt{-1}$ and B being a real number.

4,111,524
WAVELENGTH DIVISION MULTIPLEXER

Walter John Tomlinson, III, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hall, N.J.

Filed Apr. 14, 1977, Ser. No. 787,329
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.19 4 Claims

1. A wavelength division multiplexer comprising:
an output optical fiber,
a graded refractive index rod optical focusing device having a first face and a second face,
a plurality of optical sources, each transmitting input light in a different frequency range into said first face, in such a

manner that said input light is collimated by said graded refractive index rod optical focusing device, so that a plurality of beams of collimated light emerge from said second face, and

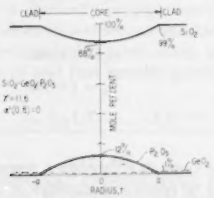
a blazed plane reflection diffraction grating for reflecting said beams of collimated input light back into said second face at angles such that said graded refractive index rod optical focusing device focuses said collimated beams of input light into said output optical fiber.

4,111,525

SILICA BASED OPTICAL FIBER WAVEGUIDE USING PHOSPHORUS PENTOXIDE AND GERMANIUM DIOXIDE

Ivan Paul Kaminow, Tinton Falls, and Herman Melvin Presby, Highland Park, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 12, 1976, Ser. No. 731,786
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.31 **5 Claims**



1. An optical fiber waveguide comprising a silica based fiber core surrounded by a cladding having an index of refraction lower in value than that of said core, and first and second dopants radially graded in concentration within said core, characterized in that said first dopant is an index-increasing dopant radially graded such that it appears with maximum molar concentration on the axis of said core and minimum molar concentration at the core-cladding interface, and said second dopant is an index-increasing dopant radially graded such that it appears with maximum molar concentration at the core-cladding interface and with minimum molar concentration on the axis of said fiber core.

4,111,526

ROTATIONALLY INDEPENDENT OPTICAL CORRELATION FOR POSITION DETERMINATION

Bernard W. Joseph, Berkley, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 12, 1977, Ser. No. 796,124
Int. Cl.² G01B 11/26; G03H 1/16; G06G 9/00
U.S. Cl. 350—162 SF **3 Claims**

1. The coherent optical correlation method of determining the angular and positional orientation of an object irrespective of the angular orientation of the object, the object being comprised of circular features and noncircular features, comprising the steps of

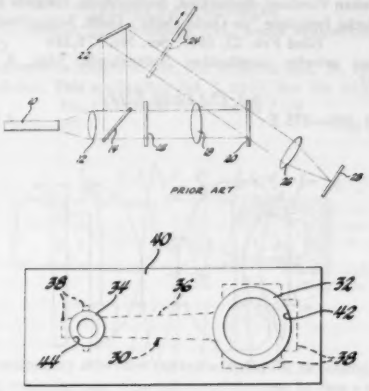
forming a coherent light image of the object,

optically forming a Fourier transform of the object image in a transform plane,

synthesizing a spatial filter representing a hologram of the Fourier transform of at least two of the circular features of the object, with the object at a specific reference position and angle,

filtering the object transform by positioning the spatial filter in the said transform plane thereby producing a resultant light pattern from the interaction of the object transform and the spatial filter,

and focusing the said resultant pattern to produce a single correlation spot in an output plane when the object is oriented at the reference angle, the position of the correlation spot in the output plane being related to the position of the object, and to produce at least two spaced correlation spots in the output plane when the object is angularly



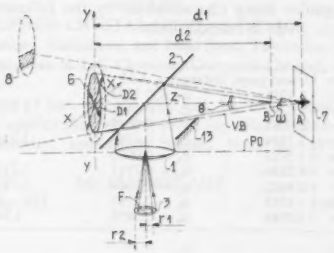
displaced from the reference angle, the spacing and relative angular relationship of the correlation spots being indicative of the angular orientation of the object.

4,111,527

DISPLAY INSTRUMENT USING OPTICAL COLLIMATION

Yves Cojan, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 17, 1977, Ser. No. 807,686
Claims priority, application France, Jun. 22, 1976, 76 18926
Int. Cl.² G02B 27/14
U.S. Cl. 350—174 **5 Claims**



1. A display instrument using optical collimation for projecting images of luminous objects into the observer's normal line of sight, said instrument comprising: a transparent combining glass positioned in said line of sight and having a surface for reflecting said projected images into said line of sight; an optical objective for projecting said images of luminous objects focused at infinity onto said surface; light emitting means for providing said luminous objects; and means for enlarging the original optical pupil defined by the outline of the image of the optical objective projected by single reflection from the combining glass into said line of sight, the said enlarging means comprising a plane reflective optical element arranged parallel to the plane of the combining glass and located between the said combining glass and the plane in which lies said optical objective to form by double reflection from said combining glass an additional optical pupil in conjunction with said original pupil.

4,111,528
MAGNIFIER

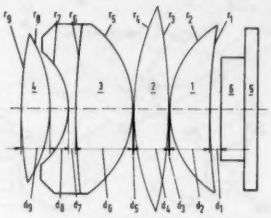
Frits Johan Versteeg, Rotterdam, Netherlands, assignor to N.V. Optische Industrie "de Oude Delft", Delft, Netherlands

Filed Feb. 23, 1977, Ser. No. 771,184

Claims priority, application Netherlands, Mar. 3, 1976, 7602197

Int. Cl.[2] G02B *9/34*

U.S. Cl. 350—175 E **2 Claims**



1. A magnifier having a relative aperture exceeding *f*/1, an angle of view wider than 2° × 25°, and as viewed in the direction of the observer, successively consisting of:

(a) a first component consisting of a positive lens;

(b) a second component consisting of a lens of positive power;

(c) a third component consisting of a meniscus-shaped lens having its concave side facing the observer, and comprising two components cemented together; and

(d) a fourth component consisting of a lens of positive power; the power of the refractive surface of the third component facing the observer having a value between 0.63/*f* and 1.03/*f*, and the sum of the powers of the two refractive surfaces of the fourth component being less than 0.65/*f*, the improvement which comprises that the sum of the powers of the two refractive surfaces of the second component has a value of between 0.15/*f* and 0.55/*f*, and the sum of the powers of the two refractive surfaces of the fourth component exceeds 0.45/*f*, said magnifier being characterized by the following dimensions, given in random units:

f = 1.0 and pupil distance = 1.33		N_e/υ_e
$r_1 = -8.1981$	$d_1 = 0.1273$	
$r_2 = -1.3296$	$d_2 = 0.5451$	1.737/51.4
$r_3 = +5.8038$	$d_3 = 0.0080$	
$r_4 = -3.1894$	$d_4 = 0.4786$	1.716/53.6
$r_5 = +1.3923$	$d_5 = 0.0080$	
$r_6 = -8.5846$	$d_6 = 0.7711$	1.716/53.6
$r_7 = +0.9632$	$d_7 = 0.1064$	1.792/25.6
$r_8 = +1.8353$	$d_8 = 0.2393$	
$r_9 = -5.0548$	$d_9 = 0.3856$	1.748/44

4,111,529
OPTICAL SYSTEM FOR AN ENDOSCOPE

Nobuo Yamashita, Tama, Japan, assignor to Olympus Optical Co., Ltd., Japan

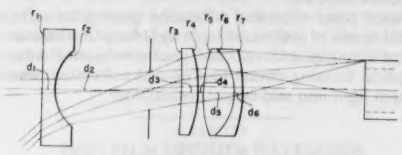
Continuation of Ser. No. 602,31 2, Aug. 6, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,442

Claims priority, application Japan, Aug. 14, 1974, 74/92308

Int. Cl.[2] A61B *1/06*; G02B *9/12*

U.S. Cl. 350—225 **1 Claim**

1. An optical system for an endoscope comprising an image fiber for transmitting an image of an object to be observed and an objective arranged adjacent to one end face of said image fiber in order to form an image of the object on said end face of said image fiber, said objective comprising a first, second and third lens component, said first lens component being a negative singlet lens, said second lens component being a positive singlet meniscus lens, and said third lens component being a cemented positive doublet lens, the stop of said optical system for an endoscope being arranged between said first lens component and said second lens component, the optical axis of



said objective being parallely shifted from the center line of said image fiber, in which said objective has numerical values as given below:

$r_1 = \infty$		
$d_1 = 0.6$	$n_1 = 1.51633$	$\nu_1 = 64.1$
$r_2 = 2.175$		
$d_2 = 6.49$		
$r_3 = -49.125$		
$d_3 = 1.0$	$n_2 = 1.69680$	$\nu_2 = 55.7$
$r_4 = -6.007$		
$d_4 = 0.2$		
$r_5 = 7.42$		
$d_5 = 1.6$	$n_3 = 1.62041$	$\nu_3 = 60.3$
$r_6 = -3.187$		
$d_6 = 0.5$	$n_4 = 1.84666$	$\nu_4 = 23.9$
$r_7 = -6.888$		
f = 2.5	F 1 : 3	

wherein reference symbols r_1 through r_7 respectively represent radii of curvature of respective surfaces of respective lenses, reference symbols d_1 through d_6 respectively represent thicknesses of respective lenses and airspaces between respective lenses, reference symbols n_1 through n_4 respectively represent refractive indices of respective lenses, and reference symbols ν_1 through ν_4 respectively represent Abbe's numbers of repective lenses.

4,111,530
MICROSCOPE OBJECTIVE MOUNT

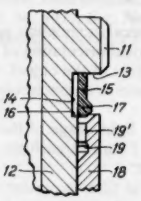
Werner Fuehrer; Richard Huttel, both of Ehringshausen; Robert Lisfeld, Ulm, all of Fed. Rep. of Germany, and Karl Leonhardt, deceased, late of Greifenthal, Fed. Rep. of Germany, by Herta Leonhardt, administratrix, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Dec. 3, 1976, Ser. No. 747,176

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554749

Int. Cl.[2] G02B *7/02*; F16L *27/08, 21/04*

U.S. Cl. 350—252 **10 Claims**



1. In a microscope objective mount including an elongated and generally cylindrical objective mounting element, means at one end of said mounting element for screwably attaching the element to a microscope, a sleeve surrounding said mounting element, and means for rotatably securing said sleeve to said mounting element, said securing means including a first annular groove in the outside surface of said mounting element and a second annular groove in the inside surface of said sleeve and an elastically deformable ring member interengaging with

both of said grooves at least in part in spring-locking relationship, wherein the improvement comprises said second annular groove having a shoulder positioned near the axially forward end thereof said shoulder extending toward but being recessed from the mounting element and said shoulder, upon securing of said sleeve and said mounting element in spring-locking relationship, being positioned opposite said first annular groove, whereby said shoulder presses said ring member into said first annular groove and whereby said first annular groove may be made shallow in view of said recessed relationship; axially opposed first and second abutment surfaces on said mounting element for engaging said ring member therebetween, said first abutment surface comprising a shoulder of said first annular groove, and said second abutment surface comprising a collar disposed on said mounting element axially opposite the shoulder of said first annular groove, said collar extending radially from said mounting element; and said ring member having a radially extending protrusion thereon adapted for interengagement with said second annular groove upon securing of said sleeve and said mounting element, said ring member being formed so that it is elastically pressed into said first annular groove by the shoulder of said second annular groove, at least in the region of spring-locking relationship, in axial abutment with the shoulder of said first annular groove and with said collar.

4,111,531

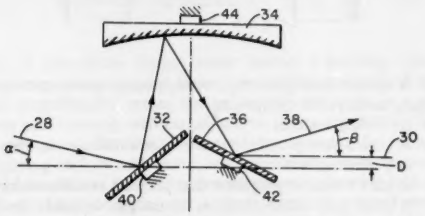
MULTI-DIMENSIONAL CORRECTIVE SYSTEM FOR LONG RADIATION BEAMS

Joseph E. Lavelle, Wellesley, and James L. Munroe, Nonantum, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.SHINGTON

Filed Jun. 16, 1976, Ser. No. 696,693

Int. Cl.[2] G02B *5/10*

U.S. Cl. 350—293 **5 Claims**



1. A reflective relay system for realigning long beams of radiation comprising:

a propagating beam of radiation;

a first long channel through which said propagating beam travels along an axis, said beam exiting said first channel with a divergence characteristic and centered about a first axis at a predetermined orientation;

a first plane reflecting surface positioned to receive said propagating radiation beam from said first channel along said axis and redirect it;

a concave reflecting surface positioned to receive radiation from said first plane reflective surface;

the curvature of said concave reflecting surface being related to the divergence of said propagating beam of radiation to produce cnvergence of the radiation redirected thereby;

a second channel having an axis with a predetermined displacement and angular orientation with respect to the axis of said first channel;

a second plane reflecting surface positioned to receive the radiation redirected from said concave reflecting surface and redirect it along the axis of said second channel.

4,111,532

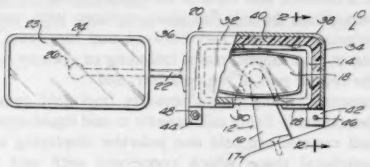
TEMPORARY SIDE VIEW MIRROR FOR COVERING A VEHICULAR MIRROR

Joseph D. Budish, 1635 Madison Ave., South Milwaukee, Wis. 53172

Continuation-in-part of Ser. No. 805,450, Jun. 10, 1977, abandoned. This application Jul. 5, 1977, Ser. No. 812,917

Int. Cl.[2] G02B *5/08*; A47G *1/24*

U.S. Cl. 350—307 **10 Claims**



1. A temporary side view mirror adapted for mounting on an existing vehicular side view mirror of the type having a mirror pivotally mounted inside a stationary housing supported on the exterior of the vehicle comprising:

a casing arranged to fit over and at least partially enclose the housing of the existing side view mirror, said casing having opposed inner and outer side walls and a rear wall for covering the mirror portion of the existing side view mirror;

an arm extending laterally outwardly from said casing outer side wall and having an outer end portion spaced outwardly from the existing side view mirror;

a mirror having a rear reflective surface and pivotally mounted on the outer end portion of said arm for affording a selectively adjustable field of view alongside and behind a load being towed by the vehicle; and

means for securing said casing onto the housing of the existing side view mirror.

4,111,533

LIQUID CRYSTAL DISPLAY DEVICE

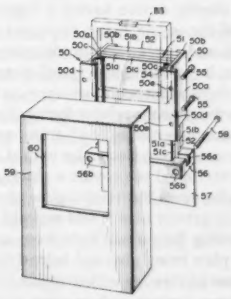
Kenji Nakamura, Kamakura, and Iwao Seno, Toyonaka, both of Japan, assignors to L C Chemical Company Limited, Tokyo, Japan

Continuation of Ser. No. 586,898, Jun. 16, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,554

Claims priority, application Japan, Nov. 15, 1974, 49-138555[U]

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—337 **14 Claims**



1. A liquid crystal display device comprising in combination:

a twisted nematic liquid crystal cell including a pair of transparent substrates carrying on the inner surface thereof electrode means and a liquid crystal material having posi-

tive dielectric anisotropy sandwiched between said substrates,

a connector means including an electric circuit electrically connected with said electrode means for applying an electric field across said liquid crystal cell,

a pair of linear polarizers disposed adjacent said transparent substrates to sandwich said liquid crystal cell therebetween,

at least one of said pair of linear polarizers being supported in a cassette, said cassette comprising a pair of rigid support plates having flat inner surfaces with said linear polarizer mounted therebetween and supported by said plates, said support plates including an opening to expose the central part of the polarizer, and

a cassette holding means separate from said cassette for demountably fixing said cassette to said liquid crystal cell, said cassette and said one polarizer displaying an outer peripheral shape which cooperates with said cassette holding means such that said cassette is positionable in two alternate fixed positions, 90° from one another in a common plane, relative to said cell, without moving said holding means relative to said cell.

4,111,534

OPTICAL DISPLAY DEVICE

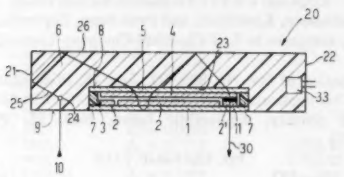
Werner Cirkler, Ismaning, and Hans Krüeger, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 27, 1977, Ser. No. 791,514

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619352

Int. Cl.² G02F *1/13*

U.S. Cl. 350—345 **10 Claims**



1. An optical display device having a high contrast in the light intensity of the image being displayed relative to the background light, said display device comprising a liquid crystal cell having a layer of liquid crystal material interposed between spaced front and rear transparent carrier plates, said carrier plates on their inner surfaces facing the layer of liquid crystal material being provided with transparent conductive coatings to form transparent electrodes with at least one of said coatings being interrupted to provide a plurality of separately excitable electrodes; and a fluorescent plate of material with an index of refraction greater than 1, said material having fluorescent centers creating fluorescent light from an ambient light, said fluorescent plate being disposed behind the liquid crystal cell in the direction of viewing with a surface of the fluorescent plate being in direct contact with an outer surface of the rear carrier plate so that an application of a voltage to selected electrodes of the cell causes a change in the optical properties in a selected area of the liquid crystal layer to decouple light from the display with an intensity substantially greater than the intensity of the background of the display.

4,111,535

GAS-PERMEABLE LENS

Samuel Loshaek, and Chah M. Shen, both of Chicago, Ill., assignors to Wesley-Jessen Inc., Chicago, Ill.

Filed Oct. 12, 1976, Ser. No. 731,675

Int. Cl.² G02C *7/04*

U.S. Cl. 351—160 **10 Claims**

1. A transparent optically clear gas-permeable contact lens consisting essentially of a plasticized cellulose resin selected from a partially esterified or partially etherified cellulose polymer plasticized with a compatible plasticizer in an amount sufficient to increase the oxygen permeability of the cellulose resin at least about 13% higher than that of the unplasticized cellulose resin but below that at which the optical and physical properties of the lens are substantially adversely affected.

4,111,536

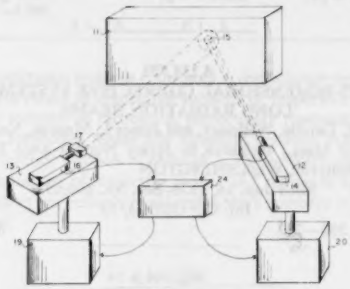
AUTOMATIC REGISTRATION OF PROJECTOR IMAGES

Charles L. Taylor, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,208

Int. Cl.² G03B *29/00*

U.S. Cl. 352—132 **16 Claims**



1. A system for registering overlapping projector produced images, said system comprising:

a. a viewing surface;

b. at least a first projector that projects different images on said viewing surface;

c. at least a second projector that projects at different times at least two different types of images on said viewing surface that overlap the image produced by said first projector, said second projector being under the control of an operator who determines and controls the type of image that will be projected by said second projector in a given instant of time;

d. a laser pointed in the direction of said viewing surface and at any location of the image produced by said first projector, said laser attached to said first projector so that said laser will emit a reference point on said viewing surface;

e. means for sensing the location of said reference point on said viewing surface attached to said second projector, said sensing means having a known geographic detection point and being pointed in the direction of said viewing surface at a location of the image produced by said second projector;

f. a first means for moving connected to said first projector, permitting said first projector with said laser attached thereto to be moved relative to said viewing surface so that the image produced by said first projector and the reference point emitted by said laser may be moved across said viewing surface with said reference point always pointing to the same relative location of the image produced by said first projector;

g. a second means for moving connected to said second

projector, permitting said second projector with said sensing means attached thereto to be moved relative to said viewing surface so that said sensing means may track said reference point; and

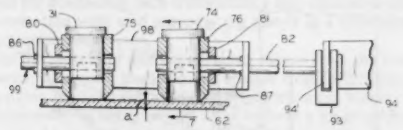
h. computation and control means coupled to said laser, said sensing means, and said first and second moving means for calculating the location of said reference point relative to said image produced by said first projector; the type of image that is produced by said second projector under the direction and control of said operator using the information supplied by said sensing means and said laser so that said computation means may compute the difference in azimuth and elevation between said reference point and said geographic point and produce a voltage that is proportional to the error in azimuth and elevation between said reference point and said geographic point causing said control means to signal and cause said first or second moving means to move, whereby said sensing means will always be locked on said reference point and the images produced by said first and second projectors will always be registered on said viewing surface and produce a believable composite picture.

4,111,537

OPTICAL STRUCTURE FOR MICROFICHE READER

Thomas R. Wells, Des Plaines, Ill., and Theodore E. Dahlen, West Bend, Wis., assignors to Bell & Howell Company, Chicago, Ill.

Filed Oct. 14, 1975, Ser. No. 621,905
Int. Cl.[2] G03B *3/00*
U.S. Cl. 353—101 **10 Claims**



1. A microfiche image reader having a housing; optical projection means in said housing including a source of light and magnification means for projecting said light in a path from said housing; said magnification means comprising side-by-side image forming lenses and lens mounts for slidably receiving each of said lenses; moveable plate means mounting said lens mounts for alternative selective movements into and out of said light path; and a single focusing control means means for concurrently focusing said lenses, said single focusing control comprising separate lens adjusting means individually engaged with each of said image-forming lenses, bearing means mounted on each of said lens mounts for loosely receiving said separate lens adjusting means for allowing vertical play adjusting means, linkage means interconnecting said separate lens for concurrent movement, said play between the separate lens adjusting means and said bearing means enabling said lens mounts and lens carried thereby to align themselves within the play allowed by said bearing means in order to isolate the effect of any physical misalignment between the relative positions of said lenses while maintaining said lenses perpendicular to said light path.

4,111,538

PROJECTION SYSTEM OF HIGH EFFICIENCY

Nicholas K. Sheridon, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

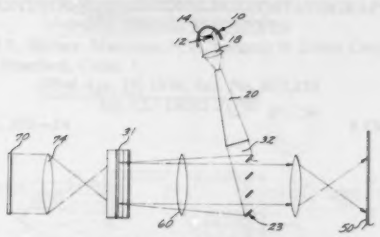
Filed Feb. 25, 1976, Ser. No. 661,225
Int. Cl.[2] G03B *21/00*
U.S. Cl. 353—122 **8 Claims**

1. An image projecting means including:

(1) light beam generation means to produce a non-uniform light beam and for projecting said light beam along a projection axis;

(2) light beam transmission means receiving said non-uniform light beam from said light beam generation means and comprising light pipe means, said light pipe means having internal walls with a high degree of internal reflection and tapered at an angle in the range from 1° to 60° along the projection axis of said light beam, the extent of said light beam transmission means in the direction of said projection axis completely surrounding the projection axis coextensive therewith;

(3) light beam bifrucation means to divide said light beam



into at least two subidvided light beams and including a plurality of optical stops formed thereon, said light beam bifrucation means comprising a plurality of light pipes;

(4) an imaging member to receive said subdivided light beams and to cause imagewise phase modulation of a portion of said received subdivided light beams, said imaging member being reflective; and

(5) objective lens means to receive said subdivided light beams and to focus the portion of said non-modulated sub-divided light beams onto said plurality of optical stops and to focus the modulated portion of said subdivided light beams onto a display surface, said optical steps comprising exit apertures of said light pipes.

4,111,539

ELECTROSTATIC PRINTING MASTER APPARATUS

Motoharu Fujii, Tokyo; Takao Muramatsu, Yokohoma; Noboru Koumura, Tokyo; Susumu Sugiura, Yamato; Nobuhiro Takekawa, Tokyo, and Syusei Tsukada, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 760,854
Claims priority, application Japan, Jan. 26, 1976, 51-7752
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 R **3 Claims**

1. An electrostatic printing apparatus comprising:

electrical resistance image formation means for making an electrostatic printing master having thereon an electrical resistance pattern corresponding to an optical image by applying image light upon an image formation member and heating said image formation member;

a rotatable member for carrying thereon said electrostatic printing master;

means for holding said electrostatic printing master on said rotatable member;

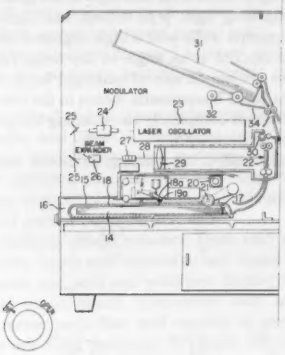
means for electrostatically charging said master to form a charge image thereon;

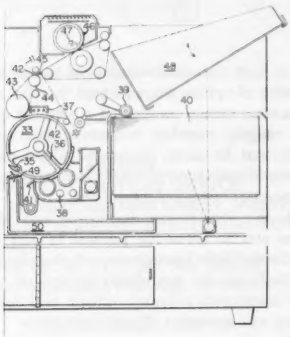
means for applying developer to said master having the charge image formed thereon;

means for transferring the developed image on said master onto a transfer member;

means for cleaning the surface of said master after transferring the developed image onto the transfer material; and

means for removing and discharging said master after use, wherein said means for electrostatically charging said





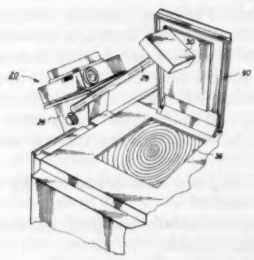
master serves also as the means for transferring the developed image onto the transfer member.

4,111,540

FIELD LENS FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

James E. Bollman, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 17, 1976, Ser. No. 687,562
Int. Cl.[2] G03G *15/01*
U.S. Cl. 355—4 **16 Claims**



2. An apparatus for transmitting a transparency light image or for holding an original document, including:

a substantially rigid frame member having an aperture therein;

a field lens mounted in the aperture of said frame member, said field lens being arranged to support the original document thereon when the transparency light image is not being transmitted therethrough and being arranged to transmit the transparency light image therethrough when the original document is not disposed thereon; and

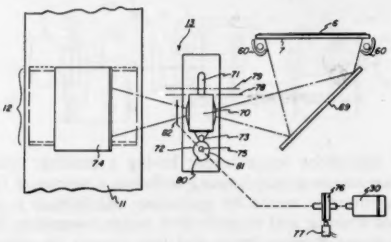
a cover member mounted movably on said frame member, said cover member being mounted movably from an opened position permitting the original document to be disposed on said field lens or the transparency to be copied and to a closed position securing releasably thereon the original document.

4,111,541

EXPOSURE SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINES

Robert H. Townsend, Richardson, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 8, 1976, Ser. No. 748,803
Int. Cl.[2] G03G *15/28;* G03B *27/76*
U.S. Cl. 355—8 **1 Claim**



1. In a reproduction machine for producing selectively one or more copies of an original, the reproduction machine including a movable photosensitive member; means to charge the photosensitive member in preparation for imaging; an exposure station whereat said charged photosensitive member is adapted to be exposed to a light image of the original; a platen for supporting the original; an image projecting means forming an optical path for transmitting a full frame light image of the original on the platen to the exposure station and the photosensitive member to form a latent electrostatic image of the original on said member; the combination of:

(a) illumination means to continuously illuminate the platen and the original thereon

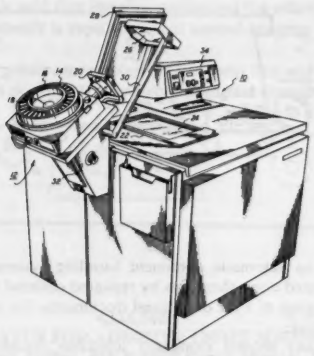
(b) optical path displacing means including a lens driving cam to displace the optical path and the full frame image formed by said image projecting means in uniform movement and in synchronism with said photosensitive member and in substantial parallelism with said photosensitive member at said exposure station, and

(c) shutter means operatively connected to said cam to expose said photosensitive member to said light image during the uniform synchronous displacement of said optical path with said photosensitive member, and to prevent exposure of said photosensitive member to said light image during return of the optical path.

4,111,542
COLLATING SYSTEM FOR OPAQUE DOCUMENTS AND SLIDE REPRODUCTIONS

Louis D. Mailloux, Webster, and James E. Bollman, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1977, Ser. No. 791,261
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 **12 Claims**

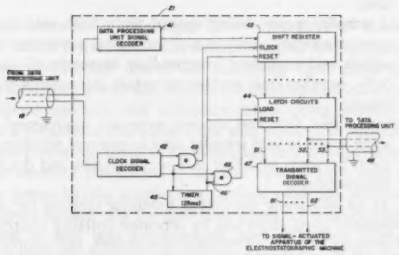


1. An electrostatographic printing machine, including:
means for storing a plurality of transparencies;
means for supporting at least one opaque original document;
means for reproducing transparencies and opaque original documents to form copies thereof;
means for advancing each transparency into operative communication with said reproducing means in a preselected sequence; and
means for switching said reproducing means from the transparency copying mode to the opaque original document copying mode in response to a pre-determined number of transparencies being copied so as to form a set of ordered copies having copies of the transparencies and opaque original documents.

4,111,543
APPARATUS AND METHOD FOR NOISE IMMUNITY IN DISTRIBUTING CONTROL SIGNALS IN ELECTROSTATOGRAPHIC PROCESSING MACHINES

Edward L. Steiner, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 15, 1976, Ser. No. 677,108
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—14 **5 Claims**

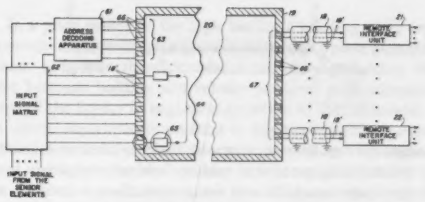


4. A system for controlling processing stations of an electrostatographic machine comprising:
at least one remote interface unit, said interface unit applying control signals from instruction signals to processing stations associated with said remote interface unit and including signal storing means for storing a preset block of said instruction signals for application as said control signals; and
a data processing unit, said data processing unit in at least partial response to an operational status of said electrostatographic machine periodically transmitting said preset block of instruction signals to said remote interface unit, said remote interface unit including apparatus for deriving said control signals from said instruction signals stored in said remote interface unit.

4,111,544
APPARATUS AND METHOD FOR NOISE IMMUNITY FOR CONTROL SIGNALS IN ELECTROSTATOGRAPHIC PROCESSING MACHINES

Edward L. Steiner, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 15, 1976, Ser. No. 677,110
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—14 **3 Claims**



1. In an electrostatographic reproduction machine, a system for controlling processing stations comprising:
a data processing unit
at least one remote interface unit, said interface unit being adapted to receive and store instruction signals, plural machine sensors for generating input signals, plural electrical couplings coupling said data processing unit with said remote interface unit and with said machine sensors, said data processing unit periodically transmitting said instruction signals through said electrical couplings to said remote interface unit, said remote interface unit providing control signals to associated ones of said processor stations in response to said instruction signals, and
means to minimize the effects of electro-magnetic radiation on signals transmitted to and from said data processing unit including shielding means for shielding said data processing unit against electro-magnetic radiation, said shielding means including shielding material means covering said data processing unit, electro-optic coupling means between said electrical couplings and said data processing unit for transmitting input signals and instruction signals through said shielding material to and from said data processing unit, and means for determining a probable logic state of said input signals transmitted to said data processing unit through said electro-optic coupling means.

4,111,545
VIBRATING BLADE CLEANER

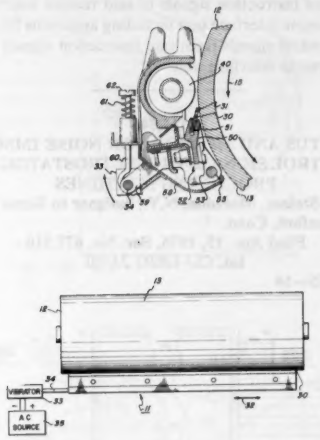
David W. Meltzer, Miami, Fla., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 6, 1975, Ser. No. 547,522
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—15 **28 Claims**

27. A cleaning apparatus for removing particulate material from the surface of a movable electrostatic imaging member, said apparatus comprising:
means for removing said particles from said surface compris-

ing at least one blade member extending across said surface and having an edge engaging said surface;

means for providing relative movement between said blade member and said imaging surface; and



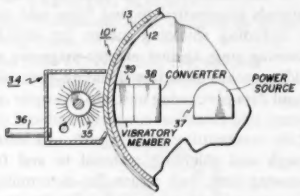
means for rapidly vibrating said blade member in a direction substantially parallel to said surface and transverse to the direction in which said imaging surface is moved, said vibrating means providing a vibrational velocity at said blade edge which is greater than the surface velocity of said imaging surface.

4,111,546

ULTRASONIC CLEANING APPARATUS FOR AN ELECTROSTATOGRAPHIC REPRODUCING MACHINE

Arthur R. Maret, Roselle, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1976, Ser. No. 718,651
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—15 **5 Claims**



1. In an electrostatographic reproducing apparatus including an imaging surface arranged for movement past a plurality of processing means; said processing means including: means for forming an electrostatic image on said surface, means for developing said image to render it visible, means for transferring said developed image to a sheet of final support material, and cleaning means for removing residual material remaining on said surface following transfer of said developed image; the improvement wherein said apparatus includes:

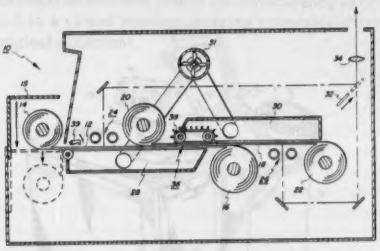
means for vibrating said imaging surface as it is acted upon by said cleaning means, said vibrating means being arranged behind said imaging surface at a position in opposition to said cleaning means.

4,111,547

DUPLEX DOCUMENT COPYING

Denis J. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 14, 1977, Ser. No. 806,565
Int. Cl.[2] G03B *27/32, 27/52*
U.S. Cl. 355—24 **8 Claims**



1. In an automatic document handling system for making pre-collated copy sheet sets by repeated collated recirculation and imaging of a set of original documents, the improvement comprising:

first and second elongated windable document holding webs,

said first and second webs each having a document supporting side adapted to support documents thereon for movement with said webs and for imaging of said documents thereon,

said first and second webs being wound into spaced apart scrolls of said web,

said first and second webs each having minor unwound intermediate unwound segments extending between said web scrolls;

first and second imaging stations for imaging documents on said unwound intermediate segments of said web for said copying of said documents;

said document supporting side of said first web being unobstructedly exposed at said first imaging station and said document supporting side of said second web being unobstructedly exposed at said second imaging station;

drive means for recirculating said first web through only said first imaging station, and said second web through only said second imaging station between said scrolls, to provide repeated recirculating unobstructed copying of documents thereon; and

transfer means for transferring documents from said first web to said second web so that one side of the documents is exposed in said first imagaing station and the other side of the documents is exposed in said second imaging station,

said transfer means being spaced from both said first and second imaging stations and including a transfer area in which said unwound intermediate segments of said two webs overlap one another to retain documents therebetween;

wherein said first and second webs are maintained at the same speed in said transfer area to prevent relative movement between said first and second webs and documents therebetween.

7. In an automatic document handling method for making pre-collated copy sheet sets by repeated collated recirculation and imaging of a set of original documents, the improvement comprising;

winding first and second elongated windable document holding webs between spaced apart scrolls of said web,

moving minor unwound intermediate unwound segments of said first and second webs through respective first and second imaging stations for imaging documents on said unwound intermediate segments of said web for said

copying of said documents with a document supporting side of said first web being unobstructed exposed at said first imaging station and a document supporting side of said second web being unobstructedly exposed at said second imaging station;

transferring documents from said first web to said second web in a transfer area in which said unwound intermediate segments of said two webs are overlapped to retain documents therebetween so that one side of the documents is exposed in said first imaging station and the other side of the documents is exposed in said second imaging station; and

preventing relative movement between said first and second webs and documents therebetween in said transfer area.

4,111,548

APPARATUS FOR ADDITIVE LIGHT MIXING

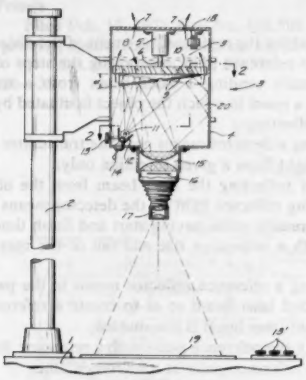
Miloslav Ivanov Pechev, and Varban Petrov Shentov, both of Sofia, Bulgaria, assignors to Directzia "Uchebno-Technicheski Sredstva", Sofia, Bulgaria

Filed Jan. 31, 1977, Ser. No. 764,468

Claims priority, application Bulgaria, Jan. 30, 1976, 32237

Int. Cl.[2] G03B *27/52, 27/54, 27/76*

U.S. Cl. 355—30 **5 Claims**



1. Apparatus for mixing light from a plurality of sources each of which provides a different color light, said apparatus comprising reflection means for reflecting light from said sources along an optical axis, means for rotating said reflection means about said axis, said reflection means being adapted to provide a maximum reflection from said sources in sequence during each rotation thereof, a converging lens arrangement, a negative receiver positioned along said optical path, said reflection means having a reflecting surface mounted obliquely with respect to said axis for directing a bulk of reflected light therefrom to said lens arrangement, said reflecting internal surface being adapted to redirect the remainder of the light from said reflection means to said lens arrangement, said reflection means being affixed to a support having cooling vanes about its periphery and mounted on a shaft of a motor which shaft is aligned with said axis, and/a housing containing the above-recited apparatus, said housing having a reflecting internal surface.

4,111,549

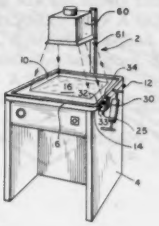
PLATEMAKER AND CONTACT FRAME EXPOSURE INDICATOR

Thomas R. Cazel, 516 Rose St., Addison, Ill. 60101, and Gerald C. Cazel, 811 Park, Springfield, Ill. 62704

Filed Jun. 6, 1977, Ser. No. 803,733

Int. Cl.[2] G03B *27/74;* G01J *1/42*

U.S. Cl. 355—68 **10 Claims**



1. In a plate maker of the type having a printing plate support means for mounting an unexposed printing plate assembly thereon, a holder therefor, means movably mounting the holder between holding and release positions with attendant change of the holder in angular disposition to the horizontal; a light source supported in position to impinge a light of predetermined lumens to a plate assembly carried on the support means; and light-actuable exposure indicator means carried by the movable holder having means providing an indicia signaling exposure of said means to said light; means for maintaining said indicia in said signaling condition; and means for deactivating said indicator means attendant to moving said indicator means with said holder from holding to release positions.

4,111,550

PLATEN COVER FOR PREVENTION OF DISPLACEMENT OF AN ORIGINAL

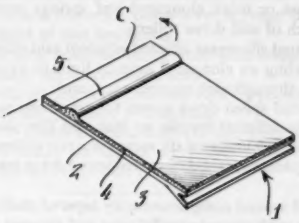
Yoshikatsu Ohishi, Tokyo, Japan, assignor to Rank Xerox, Ltd., London, England

Filed Sep. 13, 1976, Ser. No. 723,103

Claims priority, application Japan, Oct. 30, 1975, 50-146999[U]

Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—75 **1 Claim**

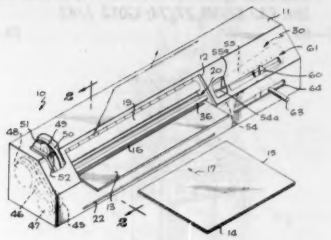


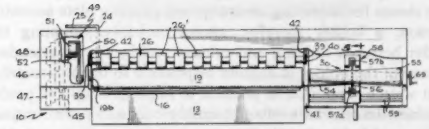
1. A copier platen cover, adapted to prevent displacement of an original document as the platen cover is closed, comprising, on the side of the cover which contacts the original, an elastic layer having a white surface and at least one raised portion integral with said layer, said raised portion being deformed with the cover in the closed position so that the unraised portion of said layer contacts the original document to secure the original document in intimate contact with the platen minimizing shade at exposure, said raised portion being positioned so that the platen cover rotates through a small angle with the force pressing the original document against the platen increasing as the cover closes.

4,111,551
PHOTOGRAPHIC DISTORTION APPARATUS

Paul A. Klann, 301 4th St., Waynesboro, Va. 22980

Filed May 14, 1976, Ser. No. 686,478
Int. Cl.[2] G03B 27/10
U.S. Cl. 355—84 8 Claims





1. A photographic distortion apparatus for producing on a photographic film sheet a contact copy of a photographic transparency that is modified in dimemsion along one axis only, comprising:

a pair of drive rollers facing each other in spaced parallel relationship,

pressure means for holding said transparency against one of said drive rollers during rotation thereof and for holding said film sheet against the other of said drive rollers during rotation thereof, said pressure means selected from the group consisting of:

(a) a pair of pressure rollers each associated with a respective drive roller, each pressure roller having a rigid shaft mounted in spaced parallel relationship to said respective drive roller and biased theretoward, and a plurality of annular roller sections mounted on said shaft, each roller section including an annular bearing portion surrounded by an annular resilient layer, and

(b) one or more elongated leaf springs pressing against each of said drive rollers,

illuminated slit means situated adjacent said drive rollers, for providing an elongated strip of light to expose said film sheet through said transparency, and

differential speed drive means for revolving said drive rollers at different speeds, so that said film sheet is moved past said illuminated slit means at a rate different from said transparency, said differential speed drive means comprising;

first and second complementarily tapered shafts facing each other with spaced parallel axes and situated adjacent one end of said drive rollers, the small end of one tapered shaft and the large end of the other tapered shaft being directly attached to a respective one end of said pair of drive rollers,

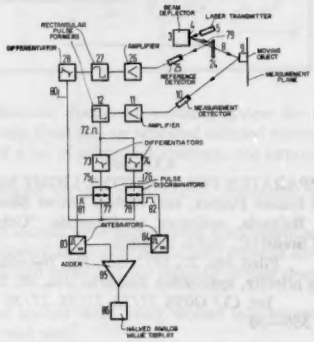
motor means for rotationally driving a first of said drive rollers and the associated tapered shaft, and

rotational transmission means interconnecting said complementarily tapered shafts at a selectable position axial thereof, rotation of said associated tapered shaft being transmitted to the other tapered shaft and thence to the second drive roller via said transmission means, the axial location of said transmission means determining the relative rotational speeds of said two drive rollers and hence the extent of dimensional modification along said one axis of said copy.

4,111,552
APPARATUS AND METHOD FOR MEASURING DISTANCE FROM AND SPEED COMPONENTS OF AN OBJECT TRAVELING VERTICAL TO A REFERENCE LINE

Viktor Bodlaj, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 13, 1976, Ser. No. 731,650
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1975, 2546714
Int. Cl.[2] G01C 3/00, 3/08; G01P 3/36
U.S. Cl. 356—4 12 Claims



1. A method for the rapid measurement of the distance of an object from a reference point comprising the steps of:

a. periodically sending a laser beam from a transmitter through a space in which the object is situated by use of a beam deflector;

b. providing a detector means near the transmitter for picking up light from a given direction only;

c. diffusely reflecting the laser beam from the object and registering reflected light on the detector means to create a measurement pulse having start and finish times associated with a respective rise and fall of the measurement pulse;

d. providing a reference reflector means in the path of the transmitted laser beam so as to create a reference pulse when said laser beam is transmitted;

e. receiving the reference pulse with a reference detector to create a reference pulse at a reference time;

f. determining an exact middle of the measurement pulse by circuitry means utilizing the start and finish times of the measurement pulse and including measuring separately the time differences from the reference time to the respective start and finish times; and

g. calculating the distance from an average of the time differences.

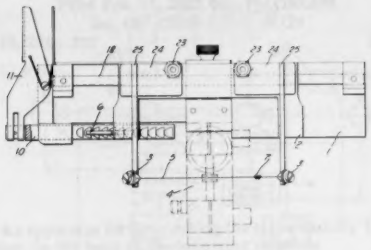
4,111,553
MULTI-SAMPLE TRANSPORTING AND HEATING APPARATUS FOR USE IN ATOMIC ABSORPTION SPECTROMETRY

Vytenis Peter Garnys, Bondi, Australia, assignor to Unisearch Limited, Australia

Filed Mar. 7, 1977, Ser. No. 775,289
Claims priority, application Australia, Mar. 30, 1976, PC5415
Int. Cl.[2] G01N 1/00
U.S. Cl. 356—36 6 Claims

1. Sequential multi-sample analysis transporting and heating

apparatus for use with an atomic absorption spectrometer using an electrothermally heated furnace for sample atomization, comprising a filament arranged to be passed longitudinally through the furnace and to be heated by the passage of an electric current therethrough, the filament being adapted to



receive a plurality of liquid samples deposited at regular intervals along its length, heating means for passing an electric current through said filament to simultaneously dry and ash the samples, and advancing means for advancing said filament, sample by sample, through the furnace to enable rapid sequential analysis of the samples to be carried out therein.

4,111,554

PROCESS FOR THE SPECIFIC QUANTITATIVE DETECTION OF SULFUR COMPOUNDS AND APPARATUS FOR CARRYING OUT THIS PROCESS

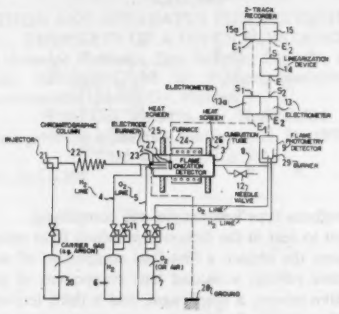
Jean-Michel Colin, and Dominique Herouard, both of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Feb. 17, 1976, Ser. No. 658,506

Claims priority, application France, Feb. 18, 1975, 75 05048

Int. Cl.[2] G01N *1/00, 21/58*

U.S. Cl. 356—36 **15 Claims**



1. In a process for the detection of sulfur compounds in a sample, which may contain hydrocarbon compounds, by gas chromatography using a flame photometric detector, the improvement for specific quantitative analysis of a plurality of different sulfur compounds comprising:

— chromatographic elution of said compounds contained in the sample, thereby separating at least said sulfur compounds;

— combustion of said eluted compounds to convert completely all of the sulfur in said compounds into sulfur oxides;

— detecting seriatim the sulfur oxide combustion derivatives of the eluted sulfur compounds with said flame photometric detector and deriving therefrom an output signal which is proportional to the mass of the sulfur in each detected compound raised to a power n, a constant which is characteristic of said sulfur oxides;

— converting said photometric detector output signal to yield a quantitative linearized signal which is directly proportional to the number of molecules of sulfur detected.

4,111,555

APPARATUS FOR MEASURING THE ANGULAR DISPLACEMENT OF A BODY

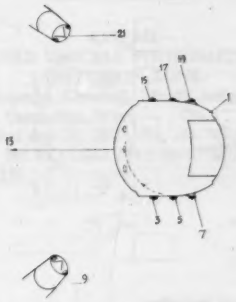
Stafford Malcolm Ellis, Bearstead, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Feb. 9, 1977, Ser. No. 766,895

Claims priority, application United Kingdom, Feb. 24, 1976, 7229/76

Int. Cl.[2] G01B *11/26*

U.S. Cl. 356—141 **7 Claims**



1. A system for defining the line of sight of an observer relative to a vehicle in which said observer is traveling by measuring the angular displacement of headgear worn by said observer with respect to a coordinate reference frame, said system comprising:

A. means for emitting radiation from

i. two sets of points

ii. of at least three non-colinear points per set,

B. said two sets of points being fixed with respect to said headgear; and

C. means for sensing, independently at each of two viewing positions, the angular positions of a set of points respectively associated with each viewing position and with respect to said reference frame over a range of angular displacement of said headgear,

i. said viewing positions being fixed with respect to said coordinate reference frame, and

ii. the fields of view from said two viewing positions being different and partially overlapping,

D. thereby to obtain a measurement of said angular position and so to define the line of sight over a wide range of angular movement of said headgear.

4,111,556

CONTROL SYSTEM FOR ALLOY TESTER

Ulrich Grisar, and Wilhelm Berstermann, both of Georgsmarienhutte, Fed. Rep. of Germany, assignors to Klockner-Werke AG, Duisburg, Fed. Rep. of Germany

Filed Mar. 10, 1976, Ser. No. 665,773

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1975, 2513267

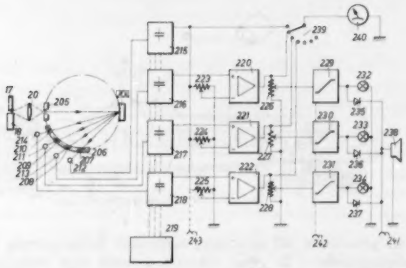
Int. Cl.[2] G01J *3/30*

U.S. Cl. 356—86 **12 Claims**

1. A system for testing an alloy workpiece formed of a basis metal and a plurality of alloying elements, said system comprising:

power-supply means including

a contact electrode adapted to engage said workpiece,
a counter electrode adapted to be spaced by a gap from said workpiece, and
an arc switch operable for passing a unipolar electrical pulse across said gap to form a spark;
a tester including
means for diffracting the light of said spark into a spectrum having lines corresponding to said basis metal and to said alloying elements and for converting said lines into respective electrical signals having respective levels corresponding to the intensities of the respective lines,
means including an integrate switch operable for integrating said electrical signals, and
means including an evaluate switch operable for reading the integrated signals and for generating an error signal when any of said integrated signals varies from a predetermined range; and



a control circuit including
first timer means connected to said arc switch for operating same for a predetermind first period and thereby passing said pulse across said gap during said first period,
second time means connected to said arc and integrate switches for operating same for a predetermined second period commencing at the end of said first period to continue passing said pulse and to integrate said electrical signals during said second period, and
third timer means unconnected to said arc switch but connected to said evaluate switch for operating said evaluate switch for a predetermined third period commencing at the end of said second period for terminating passage of said pulse across said gap and reading said integrated signals during said third period.

4,111,557

METHOD FOR THE OPTICAL DETERMINATION AND COMPARISON OF SHAPES AND POSITIONS OF OBJECTS, AND ARRANGEMENT FOR PRACTICING SAID METHOD

Hans Rottenkolber, Amerang, and Hans Steinbichler, Riedering, both of Fed. Rep. of Germany, assignors to OPTO Produkte AG, Zurich, Switzerland

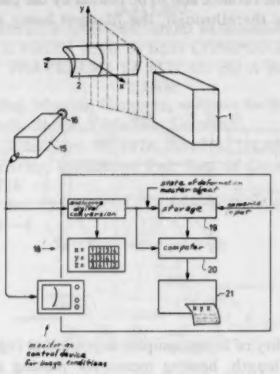
Filed Mar. 25, 1976, Ser. No. 670,104

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1975, 2514930

Int. Cl.[2] G01B *11/24*

U.S. Cl. 356—168 **21 Claims**

1. In a method for optical determination of departures in shape, changes in shape and changes in position, the improvement therewith which comprises in combination the steps of generating a light pattern upon an object with a beam of coherent light sided by image-forming optical elements, reproducing this pattern by means of an objective upon an opto-electronic receiver device, converting this pattern into electrical impulses, storing these impulses in an electronic computer after analog-digital conversion thereof, allotting digitally the converted inpulses into space coordinates and finally comparing the resulting values of space coordinates with correspondingly obtained values of the same object prior to change of position



of at least one of the surface points thereof, there being providing of lines and point arrangements as the pattern generated upon the object.

4,111,558

RETROFOCUS TYPE WIDE ANGLE OBJECTIVE LENS

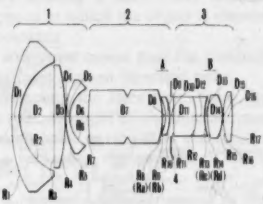
Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1976, Ser. No. 715,491

Claims priority, application Japan, Aug. 22, 1975, 50-101863

Int. Cl.[2] G02B *13/04, 11/34*

U.S. Cl. 350—189 **17 Claims**

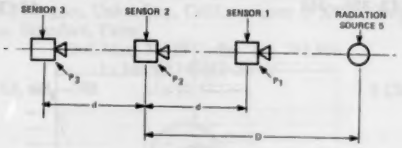


1. A retrofocus type wide angle lens comprising,
from front to rear in the direction in which light enters said lens from the object, a first lens component of negative refractive power, a second lens component of positive refractive power, a diaphragm, and a third lens component of positive refractive power,
said first lens component having at least one nonspherical surface;
said second lens component including a front positive lens group and a rear negative lens group, said front positive lens group including a rearmost double convex lens, said rear negative lens group including a frontmost negative meniscus lens convex to the image, and said rearmost double convex lens and said frontmost negative meniscus lens defining therebetween an air space functioning as a negative air lens; and
said third lens component including a front negative lens group and a rear positive lens group, said front group including a rearmost negative lens, said rear group including a frontmost positive lens, and said rearmost negative and said frontmost positive lenses defining therebetween an air space functioning as a negative air lens.

4,111,559
APPARATUS FOR DETERMINING THE TRANSMISSIVITY OF AN OPTICAL MEDIUM

Chester L. Smith, Lake Hopatcong, and David N. Everswick, Succasunna, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 17, 1977, Ser. No. 769,601
Int. Cl.[2] G01N *21/22, 21/26*
U.S. Cl. 356—201 **2 Claims**



1. An apparatus for determining the transmissivity T of a gas medium on the basis of the following equation

$$\left[T = \sqrt{\frac{E_3}{E_2}} + \sqrt{\frac{E_3}{E_2} - \sqrt{\frac{E_3}{E_1}}}\right]^{2/d}$$

comprising the combination of

a source of radiation in a gas medium, and

three radiation sensors S_1, S_2 and S_3 for measuring the amounts of radiation E_1, E_2 and E_3 respectively received thereby from said radiation source in a gas medium, wherein

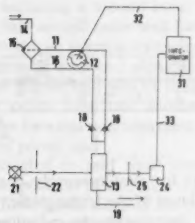
(a) said sensors are aligned with each other and said radiation source will equal spacing *d* between sensors S_1 and S_2 and sensors S_2 and S_3, the middle sensor S_2 being at an unknown distance D greater than d from said radiation source, and

(b) said sensors are located at distances $D-d$ and $D+d$ respectively from said source, where d is smaller than D.

4,111,560
METHOD AND APPARATUS FOR DETERMINING A PROPERTY OF A GIVEN SUBSTANCE

Jorma Jolanki, Helsinki; Ilpo Saxelin, Perttula, and Hannu Pönni, Suulisniemi, all of Finland, assignors to Insinooritoimisto Innotec Oy, Finland

Filed Oct. 29, 1976, Ser. No. 736,736
Claims priority, application Finland, Oct. 30, 1975, 75 3039
Int. Cl.[2] G01N *21/02*
U.S. Cl. 356—205 **9 Claims**

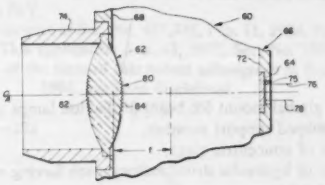


1. In an instrument for measuring a property of a given substance by comparing the latter with a reference substance, a single receiving means for receiving both the given substance and the reference substance, said receiving means being permeable to predetermined radiation capable of travelling through said receiving means and the substance therein to be absorbed to different degrees by the given substance and the reference substance, means for directing said predetermined radiation through said receiving means and a substance therein to be absorbed by the latter substance and to travel beyond said receiving means, feed means for feeding the given substance and the reference substance alternately through said receiving means while maintaining the reference substance and given substance in the receiving means for given time increments during which said predetermined radiation travels through and beyond said receiving means, and radiation-responsive mpans situated in part in the path of travel of said radiation beyond said receiving means for responding to said radiation to provide alternate measurements of the radiation resulting from said given substance and the radiation resulting from said reference substance and for providing from the difference between a number of said alternate measurements which follow each other sequentially through a plurality of cycles a determination of said property of said given substance, said feed means being operatively connected with said radiation-responsive means for automatically controlling the latter to change between a pair of different measuring conditions in one of which said radiation-responsive means measures radiation resulting from said reference substance and in the other of which said radiation-responsive means measures radiation resulting from said given substance.

4,111,561
DEFOCUSED UNICELL PHOTOMETER WITH DIFFUSION ZONE

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 31, 1977, Ser. No. 763,931
Int. Cl.[2] G01J *1/42;* H01J *3/14*
U.S. Cl. 356—225 **6 Claims**



1. A defocused unicell photometer for use in photographic apparatus comprising:

a photosensitive transducer having a photosensitive surface thereon of predetermined dimension, said transducer operating to provide an output response which varies in correspondence to the intensity of actinic radiation incident to said photosensitive surface;

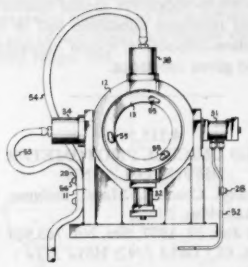
a positive lens element of predetermined focal length concentrically disposed about an optical axis which axis ultimately intersects said photosensitive surface, said lens element being spaced apart from said photosensitive surface by a distance different from said lens focal length and cooperating with said photosensitive surface to define a field of view for said photometer such that said lens element operates to direct actinic radiation incident thereon from said field of view towards said photosensitive surface, said lens element additionally having at least one light diffusing zone disposed on only a portion of the surface of said lens element for scattering that portion of actinic radiation, which directly impinges on said zone from said field of view at angles which would otherwise be refracted into a path directed toward the center of said photosensitive surface, to reduce the intensity of said portion of actinic radiation which ultimately impinges on said photosensitive surface from said zone thereby effecting a corresponding suppression in that portion of said output response from said transducer which is directly attributable to said portion of actinic radiation, and

means for stationing said transducer and lens element in substantially lighttight, spaced apart relation with respect to each other.

4,111,562
HYDRAULIC GIMBAL SYSTEM FOR BEAM PROJECTION LAMPS

Antonin J. Dvorak, Richmond Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 17, 1975, Ser. No. 587,603
Int. Cl.[2] G01N *21/16;* G01J *1/00*
U.S. Cl. 356—244 10 Claims

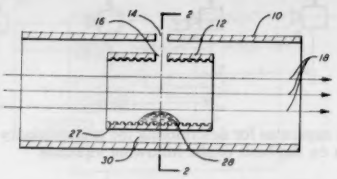


1. A gimbal mount for beam projection lamps comprising:
a U-shaped support member;
a pair of concentric rings;
a pair of hydraulic drive motors, each having a rotor shaft and a stator;
a pair of shaft position encoders, each having an input rotor and a stator;
first and second coupling means for rotatably attaching the outer ring to said support member across a diameter of said ring;
said first coupling means comprising bearing means having an inner race to which said outer ring and the rotor of one of said hydraulic motors are directly connected and an outer race attached to said support member, the stator of said one hydraulic motor being coupled to said support member;
said second coupling means comprising bearing means having an inner race directly connected to said outer ring and an outer race directly connected to said support member, the input rotor of one of said encoders being coupled to said inner race and the stator of said encoder being directly connected to said support member;
third and fourth coupling means for rotatably attaching the inner ring to said outer ring across a diameter of said inner ring;
said third coupling means comprising bearing means having an inner race to which said inner ring and the rotor of the second of said hydraulic motors are directly connected to an outer race attached to said outer ring, the stator of said second hydraulic motor being coupled to said outer ring; and
said fourth coupling means comprising bearing means having an inner race directly connected to said inner ring and an outer race directly connected to said outer ring, the input rotor of the second of said encoders being coupled to said inner race and the stator of said encoder being directly connected to said outer ring.

4,111,563
GRAPHITE TUBE ASSEMBLY HAVING A SAMPLE SUPPORTING INNER BODY

Rolf Tamm, Salem, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Dec. 2, 1976, Ser. No. 746,970
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2554950
Int. Cl.[2] G01N *21/16;* G01J *3/30*
U.S. Cl. 356—244 15 Claims

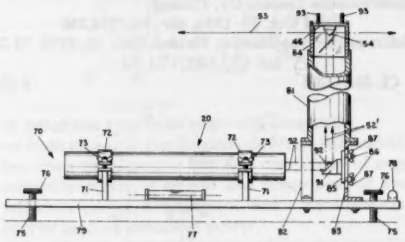


1. A graphite tube assembly for use in an atomic absorption spectrometer for measuring the flameless absorption of samples when passing a beam of light rays therethrough comprising, in combination:
a graphite tube, and
a sample supporting inner body, means mounting said inner body in the interior of the graphite tube to form an integral structure with the inner body spaced from the inside wall of said tube, but externally of the beam of light rays when passing through said graphite tube, said inner body extending only over a portion of the length of the graphite tube.

4,111,564
REFERENCE PLANE PRODUCTION

James R. Trice, Jr., 824 S. Glebe Rd., Arlington, Va. 22204

Filed Feb. 8, 1973, Ser. No. 330,599
Int. Cl.[2] G01C *5/00;* G01B *11/26*
U.S. Cl. 356—247 40 Claims



1. An apparatus for simultaneously converting a narrow highly collimated beam of electromagnetic radiation into a thin reference plane of electromagnetic radiation for measurements perpendicular to the plane, for aligning equipment and for guiding construction equipment, said apparatus comprising:
means for generating a narrow highly collimated beam of electromagnetic radiation and for directing said collimated beam in a particular orientation;
external surface reflector means for dispersing said collimated beam simultaneously into a thin plane of a substantially uniform, multitudinous array of radially diverging radiation forming a thin reference plane at a distance from said reflector means; and
means for mounting said reflector means in a position operably aligned with said collimated beam so that said colli-

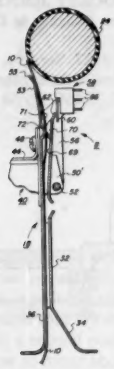
mated beam is simultaneously reflected into a substantially uniform reference plane of electromagnetic radiation, said reference plane being of a thickness and character to permit detection and measurement from equal datum positions in the plane in a direction perpendicular to said plane.

4,111,565

APPARATUS FOR SENSING WHEN PAPER UTILIZED IN A PRINTER HAS BEEN DEPLETED

Brian E. Jagger, Union City, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1977, Ser. No. 781,906
Int. Cl.[2] B41J *29/44*
U.S. Cl. 400—708 **3 Claims**



1. Apparatus for sensing whether record material is being supplied to the platen of a printer, said apparatus comprising:

a fixed guide member including a first inner wall having a first set of rounded protrusions thereon extending in a row substantially coextensive with and along the length of said platen;

a movable guide member mounted adjacent said fixed guide member for movement toward and away from said fixed guide member, said movable guide member being normally biased into a predetermined position relative to said fixed guide member when no record material is being supplied between said guide members to said platen, and being movable away from said predetermined position when record material is being so supplied, said movable guide member including a second inner wall facing said first inner wall, said second inner wall having a second set of rounded protrusions thereon extending in a row substantially coextensive with and along the length of said platen, said first and second sets of rounded protrusions being mutually offset from one another such that the protrusions of the two sets will intermesh with each other in the absence of paper; and

sensing means mounted to said fixed guide member and responsive to the position of said movable guide member relative to said fixed guide member for providing an indication as to whether or not said movable guide member is at said predetermined position.

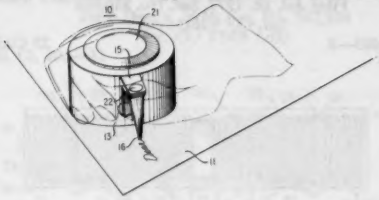
4,111,566

TRAVELLING HAND SUPPORT

Edward A. Kenwell, 21 Meadowbrook Dr., Somerville, N.J. 08876

Filed May 24, 1976, Ser. No. 689,539
Int. Cl.[2] A46B *5/02*
U.S. Cl. 401—6 **3 Claims**

1. A hand support adapted to be cupped by the hand and having a bottom surface, said bottom surface including a beveled portion and being adapted to provide first and second flat bearing surfaces when said support resides in first and second positions respectively for movement with respect to a writing surface, wherein said support includes an arm cantilevered



from said support and adapted to support a writing utensil, said utensil being in a position and of a length such that the tip thereof is in alignment with the plane of said first surface and thus in contact with said writing surface when said support is in said first position.

4,111,567

LIQUID APPLICATOR

Walter G. Berghahn, Scotch Plains, and Jack Weinstein, Old Bridge, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 657,345, Feb. 11, 1976, Pat. No. 4,050,826. This application Jan. 13, 1977, Ser. No. 758,984
The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.
Int. Cl.[2] B43K *5/00*
U.S. Cl. 401—202 **10 Claims**

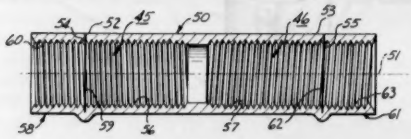
1. A liquid applicator suitable for use in the application of liquids to a surface of the human body comprising a container having a container body adapted for storing a quantity of said liquid, said container having an opening at one end thereof which is provided with an upper margin, step means spaced below said upper margin of said opening and extending inwardly from the walls of said opening, said step means being adapted to support a shaped applicator means; shaped applicator means being secured and positioned in said opening and resting on said step means; said shaped applicator means comprising a non-flexible, non-deformable, sintered, porous synthetic plastic resin structure having a controlled porosity and having omni-directional interconnecting pores, said applicator including venting means for venting the interior of said container to the atmosphere and barrier means for restricting the flow of liquid from within the interior of said container body to said shaped applicator, said venting means comprising a continuous and unobstructed path extending from the atmosphere to the interior of said container.

4,111,568

UNITARY LOCKABLE TURNBUCKLE

George S. Wing, Palos Verdes Estates, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Jul. 18, 1977, Ser. No. 816,802
Int. Cl.[2] F16D *9/00*
U.S. Cl. 403—2 23 Claims



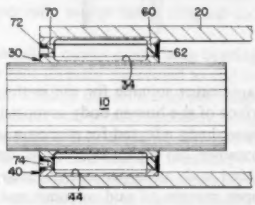
1. A unitary lockable turnbuckle comprising:
a barrel having a central axis, a first and a second end, a first face on the first end, a second face on the second end, a first axial bore entering the first end through the first end face, and a second axial bore entering the second end through the second end face, said faces extending laterally relative to the central axis and surrounding the end of their respective bores;
a first nut having a central axis, a first bearing face; and a passage entering the first nut through said first bearing face;
a second nut having a central axis, a second bearing face, and a passage entering the second nut through said second bearing face;
a first and a second shear section integral with and interconnecting the barrel with the first and the second nut, respectively;
a first and a second thread, said first thread being in phase in the passage of the first nut and in the first axial bore, said second thread being in phase in the passage of the second nut and the second axial bore, said first and second threads being of opposite hand from one another, said first faces facing one another, and said axes all being coaxial.

4,111,569

SHELL AND SHAFT SUBASSEMBLY

William Rudolph Mengel, Easthampton, Mass., assignor to Magnat Corp., Easthampton, Mass.

Filed Jun. 14, 1977, Ser. No. 806,444
Int. Cl.[2] F16C *13/00*
U.S. Cl. 403—5 3 Claims



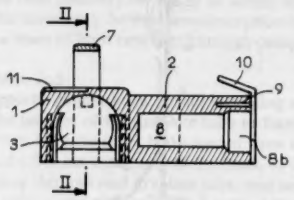
1. The combination with a shell or roller and shafting therefor, of securing means for securing the shell or roller in non-rotative relation on the shafting with the shell or roller periphery being concentric with the shafting axis, the securing means comprising:
a pair of concentrically-arranged annular inner and outer sleeves,
a pair of end rings secured to and spacing the inner and outer sleeves at their opposite ends,
the inner and outer sleeves and end rings cooperatively defining a closed annular chamber,
an endless sinuous groove in a wall of each sleeve,
the groove in the inner sleeve being disposed exteriorly of the sleeve,
the groove in the outer sleeve being disposed interiorly of the sleeve,
and means for introducing a pressurized medium to the annular chamber for expanding the walls of the two sleeves radially outwardly in opposite directions in the sinuously extending thin walled areas,
the inner sleeve expanding inwardly toward the shaft periphery and the outer sleeve expanding outwardly toward the shell inner wall,
with the expansion creating a frictional gripping engagement of each sleeve with its respective adjacent component.

4,111,570

BALL AND SOCKET JOINT CAGE

Henri Morel, Maule, France, assignor to ITW de France, S.A., Beauchamp, France

Filed Mar. 25, 1977, Ser. No. 781,223
Claims priority, application France, Mar. 25, 1976, 76 08757
Int. Cl.[2] F16C *11/10*
U.S. Cl. 403—18 8 Claims



1. In a plastic ball-and-socket joint or ball cage formed by a body comprising a cage for housing a spherical ball and at least two tongue-shaped elastic blade cantilever locking elements adapted to restrain the ball in its housing, said blades each having a projection thereon substantially opposite at least a portion of another projection on a second blade integral with the cage, a slot in said body formed behind each of said blades for permitting free radial movement thereof toward and away from said ball and latching means interconnected by a common operator, said latching means adapted to be accepted in said slot behind each blade whereby said latching means can be moved linearly to co-act simultaneously and directly with each of said blades to simultaneously urge them in locked opposed relation against the ball after said ball is inserted into said cage.

4,111,571

BALL AND SOCKET JOINTS

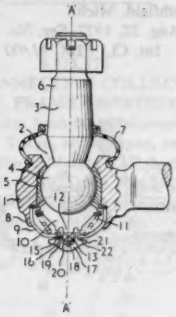
David John Rowland Farrant, Leamington Spa, England, assignor to Automotive Products Limited, Warwickshire, England

Filed Sep. 12, 1977, Ser. No. 832,206
Claims priority, application United Kingdom, Sep. 21, 1976, 39177/76
Int. Cl.[2] F16C *11/06*
U.S. Cl. 403—27 9 Claims

1. A ball and socket joint suitable for use on automobiles which includes:
a pin with a ball thereon;
a housing receiving said ball and defining a first aperture through which said pin projects;
mating bearing surfaces on said ball and said socket such that the pin can move angularly with respect to the socket;
a first member within the housing that lies adjacent the rotatable surface of the ball;
a resilient means which biasses the first member towards the rotatable surface of the ball pin such that any wear in the ball and socket joint results in a relaxation of the resilient

means in conjunction with displacement of the first member;

and a second member having a portion slidably engaged and partially rotatably interlocked along one axis with the first member and being axially fixed relative to the housing along the one axis but rotatable relative to the housing about the one axis and the second member is readily accessible from without the housing so as to effect such rotation;



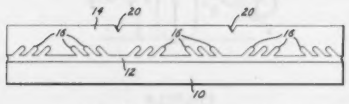
wherein; the said displacement along the one axis of the first member relative to the second member is such that when the first member is in a first position along the one axis the second member is locked against rotation about the one axis, and when the first member is in a second positon along the one axis the second member is free to rotate about the one axis, and where the said displacement is from either one to the other of said first and second positions.

4,111,572

CERAMIC-METAL ASSEMBLY

Michael J. Noone, Wayne, and Arno Gatti, Norristown, both of Pa., assignors to General Electric Company, Fairfield, Conn.

Filed Mar. 10, 1977, Ser. No. 776,281
Int. Cl.² F16B *11/00*
U.S. Cl. 403—28 **3 Claims**



1. In a structure comprising a metallized ceramic piece brazed to a metal backing by a braze alloy, the improvement comprising:

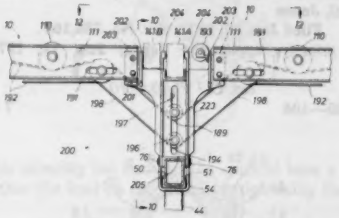
oppositely directed slots in the brazed face of the ceramic piece which are filled with the said braze alloy and the orientation of said slots are such that upon cooling of the ceramic piece the contraction of the braze alloy and backing pulls the ceramic in a direction which tends to force the braze alloy into the slots, thereby producing a mechanical bond in addition to the bond produced by the brazed joint.

4,111,573

TRIPLE LEG COUPLER

Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979

Filed Dec. 6, 1976, Ser. No. 747,554
Int. Cl.² F16B *1/00*
U.S. Cl. 403—42 **27 Claims**



1. A support and coupling member and the like, comprising:

first and second spaced-apart upright leg bracket members,

a saddle element connected to the lower end of said bracket members,

a first pair of support arms connected to the upper end of each said leg bracket members,

a second pair of support arms connected to the upper end of each said leg bracket members, and

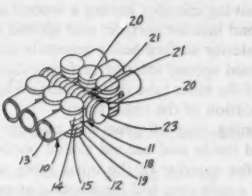
a third pair of support arms connected to the upper end of each said leg bracket members.

4,111,574

HINGE JOINT ASSEMBLY

John F. Runyon, 91 Kent St., St. Paul, Minn. 55102

Continuation-in-part of Ser. No. 397,765, Sep. 17, 1973, Pat. No. 4,074,477. This application Nov. 26, 1976, Ser. No. 744,984
Int. Cl.² E04B *1/32;* F16D *3/00*
U.S. Cl. 403—54 **15 Claims**



1. A hinge joint assembly composed of non-resilient material for flexibly connecting a plurality of at least three structural building components in the construction of modular buildings, said hinge joint assembly comprising:

(A) at least one hinge pin, and

(B) a plurality of similar flexibly interacting fastening units mounted for rotation about said hinge pin and each including:

(1) at least three rotatable connecting members each having means for loosely and rotatably engaging a longitudinally extending rigid structural component for rotation about the longitudinal axis of the component, said longitudinal axis extending perpendicular to the axis of rotation of the connecting member, and

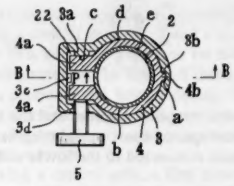
(2) a corresponding number of intermediate means mounted on said hinge pin and engaging said connecting member for securing said connecting member to said hinge pin, said connecting member being in fixed engagement with said intermediate means for pivotal movement of said connecting member about said hinge

pin, and in rotatable engagement with said intermediate means for rotational movement relative thereto about an axis perpendicular to the axes of said pin and structural component and skew relative to the axis of the pin.

4,111,575
TUBE COUPLING

Masao Hoshino, 32-6107 Mitsuike, Shiroyama-cho, Owariasahi-shi, Aichi, Japan

Filed Jan. 10, 1977, Ser. No. 758,164
Claims priority, application Japan, Jun. 11, 1976, 51-076506[U]
Int. Cl.[2] F16B 7/10
U.S. Cl. 403—104 7 Claims



1. A coupling for coupling two telescopable tubes, wherein an inner tube is telescopable into an outer tube and the outer tube has a terminal end out of which the inner tube projects, said coupling comprising:

a receiving member emplaceable over the terminal end of the outer tube and over the section of the inner tube near the terminal end of the outer tube; said receiving member having a first sleeve portion with a first interior surface; said first sleeve portion first interior surface being generally circular in cross-section; said first interior surface extending over and being engageable with the exterior of the outer tube at and away from the terminal end of the outer tube;

said receiving member having a second sleeve portion with a second interior surface; said second sleeve portion second interior surface being generally circular in cross-section; said second interior surface extending over the section of the inner tube that extends away from the terminal end portion of the outer tube;

a tightening ring of generally circular cross-section emplaced inside said second sleeve portion and engageable with the exterior of the inner tube; said tightening ring being a split ring and terminating at end portions at both sides of the split in said split ring; said ring end portions each comprising a tab projecting away from said ring in generally the same direction and said tabs having side faces and said side faces thereof being opposed and spaced apart;

ring tightening means in said receiving member and extending into engagement with at least one said ring end portion tab for biasing said ring end portions toward each other;

respective engagement formations on said ring and also on said second interior surface at a location on said ring remote from said end portions thereof; said engagement formations being in engagement such that said ring is held stationary by means of the engagement of said engagement formations against movement around said receiving member and around the inner tube in said receiving member as said tightening means tightens said ring end portions toward each other;

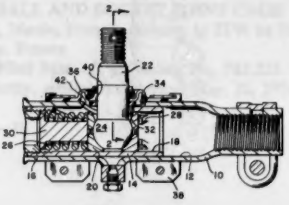
an abutment in said receiving member second sleeve portion for being engaged by and for blocking said other ring end portion from moving away from said one ring end portion as said tightening means moves said one ring end portion toward said other ring end portion; said tightening means being engageable with said one ring end portion to urge it toward said other ring end portion thereby to urge said ring end portions toward each other;

said second sleeve portion having a chamber therein shaped to receive both said ring end portion tabs and said tabs being in said chamber; said abutment for engaging said other ring end portion being in said chamber.

4,111,576
STEERING LINKAGE HAVING RESILIENT RING

David D. Jordan, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 22, 1977, Ser. No. 826,607
Int. Cl.[2] F16C 11/00
U.S. Cl. 403—134 5 Claims

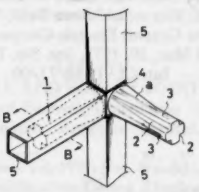


1. In a steering linkage having a housing which defines a bore, a sleeve member movable and rotatable within the housing bore and supporting a socket, a stud extending through an opening on the housing and into the socket such that the sleeve member is movable and rotatable within the housing bore to impart movement and rotation to the stud and a flexible boot sealingly engaging the stud and the housing to keep contaminants out of the housing bore, the improvement in which a ring is carried by said stud between said sleeve member and said flexible boot, said ring cooperating with said stud to prevent said flexible boot from coming in contact with said sleeve member.

4,111,577
TUBE JOINT

Kesaomi Kiyosawa, Tokyo, Japan, assignor to Nihon Space Union Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1977, Ser. No. 788,344
Int. Cl.[2] F16B 7/00
U.S. Cl. 403—172 4 Claims



1. A joint made of metal and adapted to be connected to a plurality of square pipes comprising:

a plurality of protruding joint rods interconnected at their root ends, each joint rod including plural radially protruding, longitudinally extending knurling tools, each with a shaped radial surface having a wide root end close to the root end of the joint rod and a narrow pointed end, the shaped radial surfaces being positioned at central parts of top and bottom and right and left sides of the joint rod, adjacent shaped radial surfaces being separated by fixed grooves extending from the pointed end to the root end of the knurling tool, each of said shaped radial surfaces having an arcuate-shaped protruding portion extending from

a central part thereof intermediate the ends of said knurling tool so that the diameter of each joint rod increases from a first value to a second value in a direction from the pointed end to the root end of the knurling tool, the first value being slightly less than the inner diameter of a square pipe to be held by the joint rod and the second value being at least equal to the inner diameter of the square pipe.

4,111,578

FITTINGS FOR CONNECTING COLUMNS AND BEAMS OF STEEL FRAME CONSTRUCTION

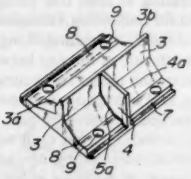
Kuniaki Sato, Hiratsuka; Yoshihiro Nakamura, Kamakura, and Hideaki Ninomiya, Tokyo, all of Japan, assignors to Kajima Corporation and Hitachi Metals, Ltd., both of Tokyo Japan

Filed Feb. 7, 1975, Ser. No. 547,775

The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.

Int. Cl.² F16B *7/00*

U.S. Cl. 403—189 **3 Claims**



1. Fittings for connecting columns and beams of a steel frame construction comprising a rectangular base plate to be connected to said column, said base plate having:

(a) a first face for mating with a column, said first face designed to conform to the contours of said column in the area of said mating;

(b) a second face directed towards a beam including a raised portion tapering outwardly, downwardly from an essentially horizontally central apex and a flat edge portion parallel thereto;

(c) a horizontal protrusion in opposition to a flange of said beam and projecting from said raised portion;

(d) a vertical protrusion in opposition to a web of said beam and projecting from said base plate to form a T-shaped protrusion with said horizontal protrusion; and

(e) seats formed on said base plates having holes for receiving bolts and formed with their longitudinal axes in the direction parallel to the horizontal protrusion.

4,111,579

SCAFFOLDING

Stephen Vincent Knight, Maghull, England, assignor to North Western Scaffolding Company Limited, Liverpool, England

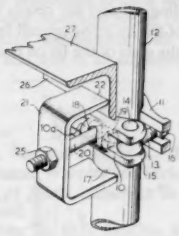
Filed Mar. 29, 1977, Ser. No. 782,371

Claims priority, application United Kingdom, Apr. 2, 1976, 13408/76

Int. Cl.² E04G *7/00*

U.S. Cl. 403—387 **8 Claims**

1. A scaffold fitting for clamping a scaffold tube to a flanged member or the like to vice versa comprising a body, means for detachably securing said body to a scaffold tube, a lever, and means aligned with said means for securing the body to the scaffold tube for tightening the lever onto the body to enable a portion of the lever to clamp the flanged member or the like directly against the scaffold tube without applying to the



means for securing the body to the scaffold tube a load any greater than the load on the means for tightening the lever.

4,111,580

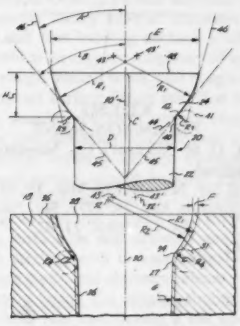
CONTINUOUSLY CURVED FASTENER HEAD AND COUNTERSINK HAVE INTERFERENCE FIT

Joseph G. Falcioni, Tacoma, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1976, Ser. No. 755,834

Int. Cl.² F16B *19/04*

U.S. Cl. 85—9 R **13 Claims**



1. A fastening system for joining workpieces with a fastener comprising:

a workpiece formed prior to joining having an aperture therethrough, said aperture having a countersink adjacent one surface of said workpiece, said countersink comprising a continuously curved surface from the bore of said aperture to said one surface, the portion of said continuously curved surface adjacent said bore diverging from said bore and providing resistance to pull through of said fastener, and the portion of said continuously curved surface adjacent said one surface having decreasing divergency with said bore and providing a surface adapted to an interference fit with said fastener;

a fastener formed prior to joining having a head shaped to be substantially congruent to said countersink and aperture, but exceeding the dimensions thereof slightly, whereby forcible insertion of said fastener in said aperture provides a structural fluid tight joint.

4,111,581

HIGHWAY MARKER

Robert S. Auriemma, Rte. #1 Box 104, Bethel, Pa. 19507

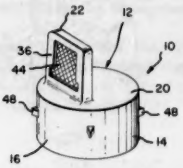
Filed Jan. 3, 1978, Ser. No. 866,261

Int. Cl.² E01F *9/00*

U.S. Cl. 404—10 **6 Claims**

1. A highway marker comprising an integral resilient flexible

body having a base adapted to be mounted on a support and a tab extending upwardly from the upper surface of the base; a reflective member-receiving recess on one sid of the tab and a retaining lip extending around the recess away from the bottom side, the ends of the lip being spaced from the bottom side, the space between the ends of the lip on both sides of the recess



and the bottom side of the recess defining an insertion slot; and a reflective member conforming to the shape of the recess and located within the recess sandwiched between the lip and the bottom of the recess, whereby the member may be inserted into or removed from the recess by flexing the tab down against the base with the one side thereof away from the base to open the slot for movement of the member through the slot.

4,111,582

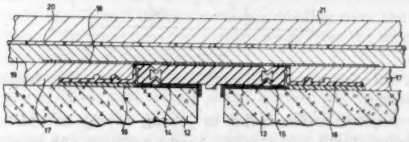
EXPANSION JOINT

Samuel Tippett, 11 St. Michael's Ct., Monkton Combe, Bath, Somerset, England

Continuation of Ser. No. 668,526, Mar. 19, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,813

Int. Cl.[2] E01C *11/02*

U.S. Cl. 404—47 **5 Claims**



1. An expansion joint buried in a roadway and bridging a gap between adjacent deck parts of a civil engineering structure the roadway consisting essentially of a plurality of strata and the expansion joint being buried in at least one of said strata and at least one of said strata being continuous over the said expansion joint, the expansion joint including an elongate elastomeric joint member disposed transversely across the roadway, said joint member consisting essentially of elastomeric material and having a body and flange parts, the body having a lower surface which is supported at respective sides of a median plane on respective deck parts whereby a central portion of the body spans the gap between the deck parts, a debonding layer between said lower surface and said deck parts, said flange parts being secured in watertight manner to the respective deck parts at each lateral side of the body whereby to form with the body a continuous waterproof roof over the gap, the body and the flange parts being formed in an integral one-piece whole of the elastomeric material, and edge portions of the body being separated from the central portion thereof by regions of the body of greater lateral compressibility than that of the edge portions and the central portion.

4,111,583

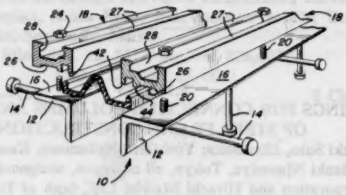
ROADWAY JOINT SEAL AND SEALING ASSEMBLY

John F. Brady, Wood Dale, and Donald J. McDowell, Riverside, both of Ill., assignors to Felt Products Mfg. Co., Skokie, Ill.

Filed May 23, 1977, Ser. No. 799,594

Int. Cl.[2] E01C *11/04*

U.S. Cl. 404—69 **11 Claims**



9. A sealing system for roadway expansion joint gaps and the like comprising: roadway slabs defining an elongated gap, a first sealing face at each side of said gap, a retainer overlying each said sealing face and defining a roadway surface, said roadway surface defining at least one elongated channel for collecting debris and for enhancing vehicular traction, continuous elastomeric seal means extending along the length of the gap and secured at each side of the gap between a said sealing face and a said retainer, and means for securing said retainer to said first sealing face, said continuous seal means comprising an elongated central arched segment, a pair of longitudinally extending legs, one extending from each side of said arched segment, and a protrusion extending upwardly from each of said legs, said seal means embedding at least one fabric reinforcement layer, said fabric layer generally extending from protrusion to stiffen, rigidify and strengthen said seal means and said protrusions, each said retainer defining an elongated recess sealingly receiving, engaging and compressing a said protrusion, defining limiter means for confronting said sealing face for limiting the compression of said protrusions, and defining a retainer lip confronting a leg of said seal means for visually indicating that sealing of said protrusion has been effected, and wherein the depth of the recess is at least 15 percent less than the uncompressed height of said protrusion and the width of the recess is greater than the compressed width of said protrusion.

4,111,584

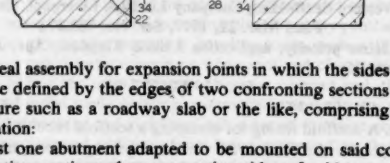
EXPANSION JOINTS SEAL ASSEMBLY

Edward Fyfe, Burlington, Canada, assignor to Elastometal Limited, Burlington, Canada

Filed Nov. 25, 1974, Ser. No. 526,682

Int. Cl.[2] E01C *11/02*

U.S. Cl. 404—69 **12 Claims**



1. A seal assembly for expansion joints in which the sides of a gap are defined by the edges of two confronting sections of a structure such as a roadway slab or the like, comprising in combination:

at least one abutment adapted to be mounted on said confronting sections along respective sides of said gap and having a substantially vertical flange facing across said gap;

a clamping plate adapted to extend along said seal assembly parallel to said flange;

means releasably attaching said plate to said flange in parallel adjustably spaced relationship thereto;

a flexible sealing member of elastic material having a web portion spanning between side wall portions disposed substantially normal thereto, and substantially parallel to said flange;

said side wall portions being receivable in said space between said flange face and said plate, and said plate being adjustable by said attaching means to squeeze said side wall portion against said flange face in sealing relation therewith;

said attaching means comprising bolt means extending between said plate and said flange substantially normal thereto;

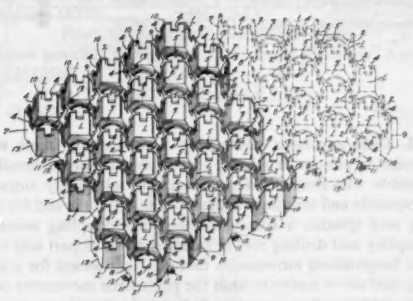
said adjustable attaching means including a yieldable resilient element adapted to urge said plate to press against said side wall.

4,111,585

MODULE AND MODULAR SUPPORT FOR TURFGRASS AND LIKE AREAS

Thomas C. Mascaro, 2210 NE. 125th St., North Miami, Fla. 33186

Filed Apr. 27, 1977, Ser. No. 791,379
Int. Cl.[2] E01C *5/20*
U.S. Cl. 404—70 **8 Claims**



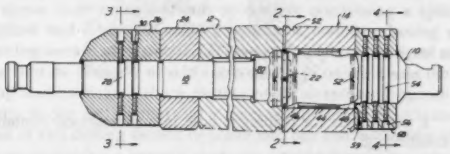
1. A module for complementary interfitting interlocked engagement with adjacent like modules adapted to be embedded in the surface of a turfgrass area to form a modular supporting structure for traffic over said area, comprising an integral non-metallic one-piece unit of honeycomb-like cellular construction having a plane bottom wall adapted to rest upon and be supported by the subjacent turfgrass soil and a plurality of vertical wall portions of uniform height and thickness extending upwardly from said bottom wall and defining a plurality of rows of cells each containing a plurality of cells of uniform cross sectional area, each of said vertical wall portions being common to an adjacent pair of cells whereby each cell in each row is contiguous to the adjacent cell in said row and to adjacent cells in the next row thereof, all of said cells being open at the upper ends thereof in the top surface of the unit and partially closed at the lower ends thereof by the bottom wall of said unit, said bottom wall having a plurality of apertures therein each of less area than the cell cross-sectional area and arranged so that at least one aperture is located in the bottom wall of each cell for drainage and extension of turfgrass roots into the subjacent soil, each of said vertical wall portions having a recessed opening in the upper edge portion thereof providing cross-communication between each adjacent pair of cells for the lateral extension from cell to cell of turfgrass roots, stolens and rhizomes, the cells in each row being laterally offset with respect to the cells in the adjacent row and providing in the respectively opposite peripheral sides of the unit alternately disposed projecting portions and recesses arranged for complementary interfitting engagement with corresponding recesses and projecting portions of an adjacent unit, a plurality of selectively positioned interlock tabs projecting from each side of the unit, and means defining tab receiving openings selectively positioned in each side of said unit, said tabs and tab receiving openings being constructed and disposed for interlocking engagement with corresponding tab receiving openings and tabs of an adjacent unit.

4,111,586

BROACH

Eugene J. Bistrick, Warren; Stewart F. Miller, Mt. Clemens; Axel B. Abrahamsson, Warren, and Richard A. Schlaf, Sterling Heights, all of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jun. 29, 1977, Ser. No. 810,993
Int. Cl.[2] B26D *1/00*
U.S. Cl. 407—16 **8 Claims**



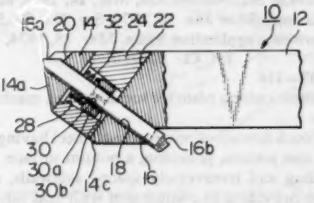
1. A tension broach comprising an elongated drawbar having a first cylindrical locating surface adjacent its forward end and a flat forwardly facing annular abutment surface at the trailing end of said first locating surface, a tubular roughing shell on said drawbar having a multiplicity of series of longitudinally aligned rough cutting teeth, said roughing shell having a cylindrical internal surface fitting said first locating surface and a flat, rear, annular abutment surface engaging the abutment surface on said drawbar, said drawbar having a second enlarged cylindrical locating surface extending rearwardly from the abutment surface on said drawbar, a tubular finishing shell on the second enlarged cylindrical locating surface of said drawbar having an internal cylindrical surface fitting said second locating surface on said drawbar and having a multiplicity of finish cutting teeth in longitudinal alignment with said rough cutting teeth, and abutment means on said drawbar having a forwardly facing flat annular abutment surface, said finishing shell at its rear end having a flat annular abutment surface engaging the abutment surface of said abutment means.

4,111,587

TOOL HOLDER

Takefumi Hatanaka, Matsudo, Japan, assignor to International Patent Transactions Company Limited, Tokyo, Japan

Filed Jul. 27, 1977, Ser. No. 819,418
Claims priority, application Japan, Jun. 10, 1977, 52-67861
Int. Cl.[2] B26D *1/00*
U.S. Cl. 407—91 **5 Claims**



1. A tool holder comprising:

a holder body having a retaining bore for slidably accommodating a bar-type tip;

a tapered bore in concentric relationship with said retaining

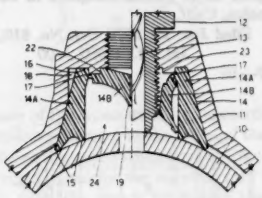
bore; and wedge means inserted within said tapered bore and movable in the axial direction thereof; whereby said wedge means is adapted to be brought into clamping engagement with the outer periphery of said bar-type tip.

4,111,588

DRILLING HOLES IN PRESSURIZED PIPES

Keith Roderick Herron, Moorooka, Australia, assignor to James Kemp & Co. Pty. Ltd., Currumbin, Australia

Filed Jan. 3, 1977, Ser. No. 756,544
Int. Cl.[2] B23B *41/08, 35/00*
U.S. Cl. 408—110 **1 Claim**



1. Apparatus for drilling a hole in a pressurized container comprising:

attachment means for attaching a drill supporting device to a surface of said container including a chamber, said device having an interior wall portion, said interior wall portion being entirely lined;

peripheral sealing means between said device and said surface surrounding an aperture for a drill in said device, said peripheral sealing means comprising an annular resilient lining in said chamber, sealed to said surface;

a seal across said aperture closed by outward pressure, but able to be opened inwards to pass said drill; said seal and said peripheral sealing means being non-rotatably mounted with respect to said attachment means;

said seal including resilient sectoral leaves angled inwards towards said surface, which in closed position are abutted tightly against one another to close said aperture; said sectoral leaves having edge flanges abutting with each other in closed position;

each of said leaves having a flange abutting against a flange on said attachment means in closed position, to restrain flexing of said leaf away from said surface;

said sectoral leaves being integral with said annular lining and connected thereto by narrow flexible portions, the top portion of said seal being recessed, said seal being adapted to varying dimensions and curvatures of said container.

4,111,589

MULTIPLE CUTTING PLATE FOR PEELING MACHINES

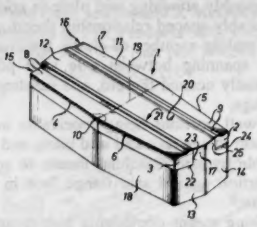
Alfons, Goeke, Soligen, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany

Continuation of Ser. No. 561,538, Mar. 24, 1975, abandoned. This application Jun. 10, 1976, Ser. No. 694,545
Claims priority, application Spain, Mar. 28, 1974, 424.739
Int. Cl.[2] B26D *1/00*
U.S. Cl. 407—114 **8 Claims**

1. A multiple cutting plate for metal peeling machines, comprising:

a metal block formed of relatively soft steel having an octagonal cross section, providing a bottom surface, vertically extending and transversely spaced sidewalls, and a top surface providing in conjunction with said sidewalls two generally parallel extending transversely spaced recesses;

two cutting blades secured to said block formed of comparatively hard material, with one cutting blade secured in one recess and the other blade in the second recess with said block forming a continuous support between the blades, each blade providing a main and secondary cutting edge which extend linearly contiguous, said edges of each blade define with respect to each other an obtuse angle, with the



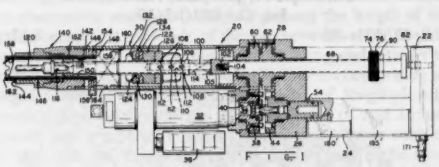
cutting edges of each blade having an approximately equal axial length.

4,111,590

POSITIVE FEED DRILL

Robert C. Burkart, Fort Wayne, Ind., and Gilbert J. Newbould, North Littleton, Nr Evesham, England, assignors to Robert E. Eash, Fort Wayne, Ind., a part interest

Filed Oct. 7, 1976, Ser. No. 730,424
Int. Cl.[2] B23B *47/18*
U.S. Cl. 408—14 **3 Claims**



1. Drill apparatus comprising a supporting frame which carries an elongated spindle for rotary and longitudinally reversible movement; drive means for selectively imparting protractile and tractile movement of said spindle and for rotating said spindle; a rotary drilling tool; coupling means for coupling said drilling tool to said spindle to impart said rotary and longitudinal movements thereto; limit means for controlling said drive means to limit the protractile movement of said tool; said coupling means including a lost-motion connecting means for providing limited relative longitudinal movement between said tool and spindle when the protractile movement of said tool is limited; said drive means comprising retraction means for retracting said spindle upon said tool reaching its protracted limit; said coupling means including a drive rod connected to said drilling tool and an adaptor carried by said spindle, one of said drive rod and adaptor having an axially extending socket therein, the other of said drive rod and adaptor telescopically fitting into said socket for relative axial movement therein, axially extending slots through the wall of the socket, radial pins slidably received by said slots and carried by the drive rod and adaptor which is telescoped in said socket, whereby said drive rod and adaptor have limited axial movement relative to each other; said lost-motion means maintaining said tool in its protracted limit position during the period required to change from protractile to retractile movement of said tool.

4,111,591

COMBINATION TAP AND DIE WRENCH

Edward M. Rolnick, North Dartmouth, Mass., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Aug. 22, 1977, Ser. No. 826,439
Int. Cl.[2] B23G *5/08, 5/10, 5/14*
U.S. Cl. 408—117 **5 Claims**

1. A combination tap and die stock wrench having a center portion and a pair of oppositely and outwardly extending arm portions from said center portion, said center portion including

an aperture extending through the thickness thereof for receiving and positively retaining tapping apparatus and said arm portions each including a plurality of individual die receptacles each adapted to receive and positively retain therein a tapping

die, wherein each of said arm portions includes at its outwardly extending end a substantially hollow extension handle for receiving and storing tapping apparatus adapted to be introduced therein through a sealable opening at its outwardly extending end.

4,111,592

MULTI-ZONE DRILLING SYSTEM WITH SPIRAL DRILLS AND QUICK ADJUSTMENT FOR FLAT AND DEEP DRILLINGS AT A MINIMUM JUTTING-OUT LENGTH OF THE DRILL ATTACHMENT

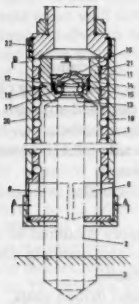
Hanns Schnitzler, Eichenweg 5, Hattingen, Ruhr, Fed. Rep. of Germany (4320)

Filed Mar. 29, 1977, Ser. No. 782,408

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614532

Int. Cl.² B23B *31/44, 5/22*

U.S. Cl. 408—197 **9 Claims**



1. In an attachment for twist drills, to adjustably limit the drilling depth thereof, a tubular chuck casing having a longitudinal axis of symmetry, to receive a twist drill therein for extension therealong, a tubular bushing smoothly fitting over and about said casing for limited rotation relatively thereto, about said axis, between first and second positions, a cylindrical pressure element smoothly fitting within said casing for adjustment relatively thereto along said axis, first clutch means carried by said element and operable to connect and disconnect said element to and from the top end of a drill in said casing, second clutch means operable to connect and disconnect said casing and said element, by and in response to rotation of said casing with respect to said bushing, between said first and second positions, respectively, and first means carried by and at the lower end of said casing, to engage and rotate a twist drill in said casing and as a unit therewith, for all positions of longitudinal adjustment of a drill in and with respect to said casing, the lower end of said casing forming a workpiece-contacting abutment.

4,111,593

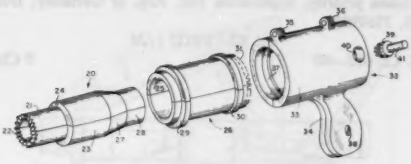
WIPED CUTTER

Rolando Carrillo, Jr., 3656½ Beethoven St., Los Angeles, Calif. 90066

Filed May 27, 1972, Ser. No. 779,688

Int. Cl.² B27B *5/12*

U.S. Cl. 408—204 **3 Claims**



1. A portable tool, for cutting wiped-lead fillets from ends of a sleeve over a cable sheath or conduit comprising a split, hollow and internally smooth cylindrical member having a cutting section with an internal diameter substantially equal to the outside diameter of said cable sheath or conduit, said cutting section having sharp cutting teeth extending longitudinally at one end thereof and a main section integral with the end of said cutting section opposite said one end, wherein said main section has a keyway along the outside thereof in a position parallel to the axis thereof, said tool further including: a split hollow cylindrical drive barrel having a key inside to fit said keyway when said barrel is fitted over said main section, said barrel having at least one annular rib and gear teeth at one end; a split housing of a length greater than said drive barrel for a substantial part of said housing to extend over the gear teeth at the one end of the drive barrel, said housing being shaped to fit over said barrel with a groove to receive said annular rib on said drive barrel, said housing having a split gripping member, each part of said split gripping member being integral with a different part of said split housing to permit an operator to hold said housing together; a gear fitted through said housing in engagement with said gear teeth at the one end of said drive barrel; and a drive shaft connected to said gear.

4,111,594

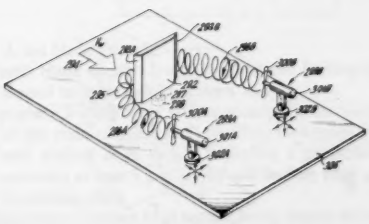
FLUID FLOW ENERGY CONVERSION SYSTEMS

Pasquale M. Sforza, 42 Mechanic St., Huntington, N.Y. 11743

Division of Ser. No. 564,681, Apr. 3, 1975, Pat. No. 4,047,832. This application Jan. 28, 1977, Ser. No. 763,590

Int. Cl.² F03D *1/04*

U.S. Cl. 415—1 **5 Claims**

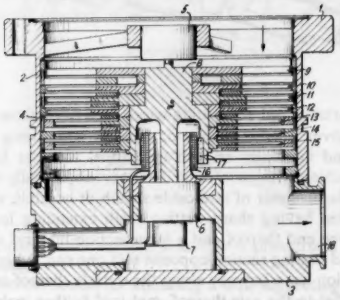


1. An energy conversion system converting the energy of natural fluid flow as in winds or waterways, to useful output power comprising bluff body vortex generating means adapted to intercept said natural fluid flow and to generate an edge separation vortex having a substantial axial velocity component, and turbine means positioned in the developed region of said vortex for extracting energy from said vortex.

4,111,595
TURBOMOLECULAR PUMP WITH MAGNETIC MOUNTING

Willi Becker, Braunfels, and Wilfried Nesseldreher, Heuchelheim, both of Germany, assignors to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Asslahr, Germany

Filed Dec. 3, 1976, Ser. No. 747,298
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2554995
Int. Cl.² F01D *1/26*
U.S. Cl. 415—90 5 Claims

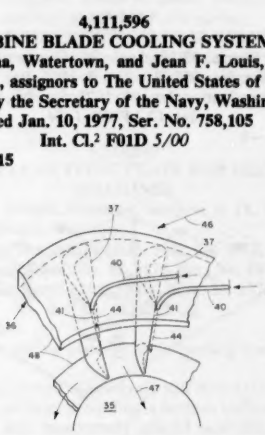


1. A turbo-molecular pump, comprising a casing having a suction side and a discharge side, a suction port at said suction side and a discharge port at said discharge side, a stator arranged in said casing, and a rotor journaled therein in magnetic bearings, said rotor having rotor discs arranged axially along the longitudinal axis of said rotor, each rotor disc having vanes, said rotor having discs positioned adjacent said suction side, adjacent said discharge side and positioned in the vicinity of the center of gravity which have relative axial thicknesses and diameters to produce a moment of inertia of the rotor about its axis of rotation which exceeds its moment of inertia about a transverse axis through its center of gravity.

4,111,596
TURBINE BLADE COOLING SYSTEM

Okon M. Amana, Watertown, and Jean F. Louis, Brookline, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 10, 1977, Ser. No. 758,105
Int. Cl.² F01D *5/00*
U.S. Cl. 415—115 10 Claims



1. A system for cooling turbine blades in a turbine having a rotor, stator and rotor blades, and respective end walls comprising:

introducing coolant longitudinally in a stream along the trailing edge of a rotor blade in the recirculation region opposite said trailing edge,

said coolant emanating from a site exterior to the blade so that blade strength is unaffected by said system,

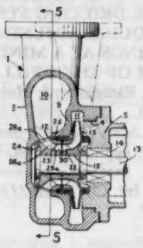
said coolant cooling the trailing edge by lowering the average temperature of the fluid in the recirculation region aft thereof,

said coolant introduced in the form of a stream of cooling air injected through said stator blade end wall for cooling stator blades and through the rotor for cooling rotor blades.

4,111,597
CENTRIFUGAL PUMP WITH CENTRIPETAL INDUCER

Carlo Grossi, Milan, and Aldo C. Taffelli, Seregno, both of Italy, assignors to Worthington Pump, Inc., Mountainside, N.J.

Filed Apr. 21, 1977, Ser. No. 789,357
Claims priority, application Italy, Jan. 10, 1976, 27915-A/76
Int. Cl.² F04D *1/02, 17/14, 29/44*
U.S. Cl. 415—143 7 Claims



1. A centrifugal pump comprising:

a. a casing defining therein, a pumping chamber, and an inlet flow passage means disposed adjacent to and in communication with the pump chamber,

b. said casing having a side inlet in communication with the inlet flow passage means,

c. said casing having an outlet in communication with the pumping chamber,

d. a driven shaft rotatably mounted in said casing and disposed to extend into the pumping chamber and into the inlet flow passage means,

e. means for rotating said driven shaft,

f. an impeller in the pumping chamber having at least one suction inlet connected to and rotatable with the driven shaft,

g. inducer means in the inlet flow passage means connected to and rotatable with the driven shaft in one given direction, said inducer having an inlet end and an outlet end so mounted in the inlet flow passage means that the outlet end is adjacent to said at least one suction inlet for the impeller,

h. said inlet flow passage means having a shape to impart pre-rotational motion to the fluid flowing therethrough and to direct the fluid into the inlet side of the inducer in a generally radial inward direction counter to the direction of rotation of the inducer,

i. a plurality of vane means in said inducer defining inducer vane passage means therebetween,

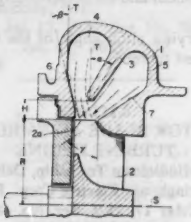
j. said vane means forming curved inducer vane passages means so sized and shaped as to turn the fluid from the radially inward flow direction at the inlet of the inducer to an essentially axial flow direction at the outlet of the inducer.

4,111,598

TURBINE CASING FOR SUPERCHARGERS

Tamotsu Kasuya, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Continuation-in-part of Ser. No. 536,195, Dec. 24, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,616
Claims priority, application Japan, Apr. 30, 1974, 49-47552
Int. Cl.[2] F01D 25/24; F02B 37/02
U.S. Cl. 415—202 3 Claims



1. In a turbine casing for superchargers including a turbine inlet casing, a baffle wall formed within the turbine inlet casing and a turbine impeller, said turbine impeller having an axis of rotation, the improvement comprising two flow paths within said inlet casing for an exhaust pressure wave, each flow path being uniform in cross section throughout its entire voluted length, said flow paths being formed by the inner wall surfaces of said casing and said baffle wall positioned therebetween, said baffle wall being inclined relative to the perpendicular to the axis of rotation of said turbine impeller, wherein one of said flow paths includes a portion of one of said inner wall surfaces opposite said baffle wall which is inclined relative to said perpendicular in a direction opposite to the inclination of said baffle wall and the other of said flow paths includes a portion of a second one of said inner wall surfaces opposite said baffle wall which is inclined relative to said perpendicular in the same direction as said baffle wall, said two flow paths joining together within said casing at a point substantially separated from said turbine impeller, that is, at a distance of at least 10% of the length of the impeller radius, and forming a common area between said flow paths and said impeller, the narrowest point in said common area being where the common area stops, that is, immediately adjacent to said impeller, wherein the baffle wall has a distal end and the impeller has an inlet part, wherein H/R is from 0.1 to 0.3 where H is a space between the distal end of the baffle wall and the inlet part of the impeller and R is a space from the inlet part of the impeller to the center of the axis of rotation thereof, said baffle wall being inclined at approximately 30° to 35° relative to said perpendicular, said inclined surface of said one of said flow paths being inclined at approximately 10° to 15° relative to said perpendicular, and said inclined surface of said other flow path being inclined at approximately 55° to 60° relative to said perpendicular.

4,111,599

CENTRIFUGAL PUMP FOR VISCOUS MEDIA

Martin Stähle, Postfach 12, 8213 Neunkirch, Switzerland

Filed Dec. 6, 1976, Ser. No. 747,497
Int. Cl.[2] F01D 5/00
U.S. Cl. 415—215 2 Claims

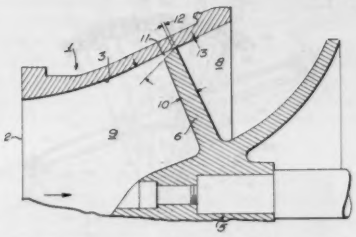
1. A centrifugal pump for a viscous conveyance medium containing solid particles comprising:

a. a housing defining a pump chamber having an internal wall defining an intake end and a discharge end;

b. a rotor journalled in the pump chamber and including at least one helical vane having a peripheral surface in confronting relation to the wall of the pump chamber dividing the pump chamber to form at one side of the vane, an intake suction chamber and, at the opposite side of the vane, a discharge pressure chamber;

c. the major portion of the peripheral surface of the vane diverging from the wall of the housing toward the intake suction chamber at an angle of divergence no greater than 40°; and

d. the remaining minor portion of the peripheral surface of the vane adjacent the side thereof exposed to the discharge pressure chamber, being in close proximity to the



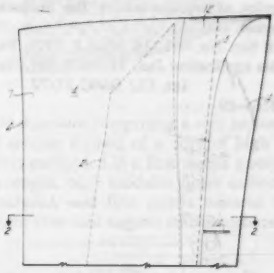
wall of the housing, and the area of said minor portion being such as to minimize the quantity of solid particles capable of being received between said minor portion and the confronting wall, the solid particles on passing said minor portion being transported away from the vane by the conveyance medium entering between said major portion and confronting wall.

4,111,600

BREAKAWAY FAN BLADE

Edward A. Rothman, South Glastonbury, and Charles E. K. Carlson, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 9, 1976, Ser. No. 749,133
Int. Cl.[2] F01D 5/28
U.S. Cl. 416—2 7 Claims



1. A fan blade having;

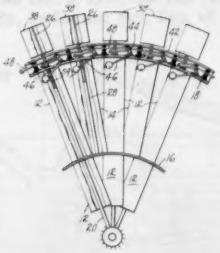
a main blade element having leading and trailing edges and shaped to form airfoil sections, and

a primary leading edge section secured to the leading edge of the main element and extending forwardly therefrom, said leading edge section including a protective sheath covering at least a portion of said leading edge portion at its leading edge,

said primary leading edge section being shaped to form, with the trailing edge of the main element, primary airfoil sections for the blade,

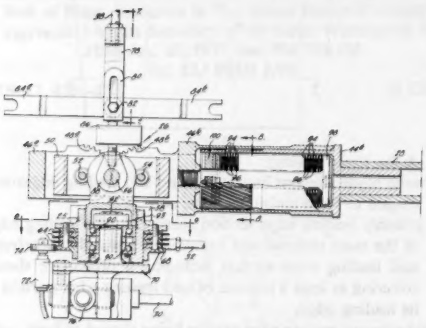
said primary leading edge section being at least in part of a material substantially more frangible than the main element so that said leading edge section may break away in part or in whole and having lines of weakness therein spaced lengthwise of the blade to provide for controlled breakage of the primary leading edge section.

4,111,601
ADJUSTABLE WINDMILL
Joseph G. Richard, 357 South St., Hyannis, Mass. 02601
Filed Feb. 2, 1977, Ser. No. 764,754
Int. Cl.[2] F03D 7/04
U.S. Cl. 416—41 **5 Claims**



1. A wind wheel adapted to being driven by the wind, comprising means defining an axis about which the wheel is adapted to rotate, a pair of radially spaced apart segmented rims, a set of generally equally spaced, radially mounted blades equal in number to the segments of each of the rims mounted inside the inner rim and having a front wind engaging surface oriented with respect to the axis to cause the wheel to rotate when subjected to wind directed generally along the axis, a plurality of interconnected movable vanes, one corresponding to each blade and each segment of each rim, mounted on the wheel outside the blades and a governor mechanism including a number of weights equal to the number of blades and connected to the vanes for sensing the speed of the wheel and adjusting the orientation of the vanes with respect to the axis to change the efficiency of the wheel in inverse proportion to its speed.

4,111,602
DEPLOYABLE ROTOR
Justin J. Barzda, Windsor, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Division of Ser. No. 664,714, Mar. 8, 1976, Pat. No. 4,017,043.
This application Jan. 31, 1977, Ser. No. 764,124
Int. Cl.[2] B64C 27/72
U.S. Cl. 416—89 **4 Claims**



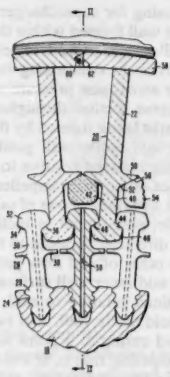
1. A speed control device for a rotatable blade mounted on a rotor hub, comprising in combination:

a pair of concentrically engaged cylinders, respective ones of said cylinders formed to be connected to the rotor hub and the blade for rotation therewith, one cylinder sliding over the other within a splined helix formed therebetween, said helix guiding the rotating blade to an increased pitch angle upon the application of centrifugal force thereto; a governing spring coaxially mounted throughout the entire length thereof within said cylinders for applying a predetermined amount of force therebetween and for uniformly compressing upon the application of centrifugal force thereto, said spring being formed of a series of alternating rubber rings and rigid plates to selectively vary the amount of pitch imparted to the blade; and

retaining means formed between each of said engaged cylinders and connected to said spring for retaining said cylinders in engagement and for compressing said spring therebetween;

whereby the varying pitch angle of the blade controls the rotational speed thereof.

4,111,603
CERAMIC ROTOR BLADE ASSEMBLY FOR A GAS TURBINE ENGINE
William F. Stahl, Middletown Township, Delaware County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 17, 1976, Ser. No. 686,860
Int. Cl.[2] F01D 5/18
U.S. Cl. 416—95 **5 Claims**



1. A gas turbine rotor and blade assembly for use in a relatively high temperature motive gas stream, said assembly comprising: a ferritic metal disc; an annular array of ceramic blades with each blade having an airfoil portion generally exposed to said high temperature motive gas and a root portion separated therefrom by a blade platform, said platforms in said array providing a generally continuous annular surface to shield said root portion from the hot motive gas; and means interposed between said disc and said blades for mounting said blades to said rotor disc in a radially spaced relationship to minimize exposure of said disc to the high temperature of said blades, said mounting means comprising:

a plurality of intermediate radially extending members attached to said disc, said members comprising a high temperature metal alloy and having a root portion for engagement within a complimentary notch in said disc and an opposite end defining means for engaging and retaining the root portion of said ceramic blades, each member further defining structure disposed in the space separating, and out of contact with, said blade root and said disc to substantially isolate said blade root from said disc and also having radially extending passages providing fluid flow communication between said root of said member and the root portion of said blades for permitting a cooling fluid delivered to said disc to flow through said passages to said blade roots for cooling the respective parts of said assembly and maintaining an acceptable temperature gradient thereacross;

whereby the ferritic metal disc is in a spaced relationship and

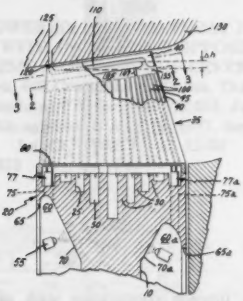
shielded from structure of said assembly having an elevated temperature and the highest temperature experienced by said disc is less than the lowest temperature on said blade.

4,111,604

BUCKET TIP CONSTRUCTION FOR OPEN CIRCUIT LIQUID COOLED TURBINES

Paul H. Kydd, Lawrenceville, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 12, 1976, Ser. No. 704,349
Int. Cl.[2] F01D *5/18*
U.S. Cl. 416—97 R **8 Claims**



1. In a gas turbine wherein a turbine disc is mounted on a shaft rotatably supported in a casing, said turbine disc extending substantially perpendicular to the axis of said shaft and having turbine buckets affixed to the outer rim thereof with platform means disposed therebetween, said buckets receiving a driving force from a hot motive fluid moving in a direction generally parallel to said axis of said shaft and the driving force being transmitted to said shaft via rotation of said turbine disc, means located radially inward of said platform for introducing liquid coolant within said turbine in a radially outward direction into an open circuit coolant distribution system comprising cooling channels extending beneath the airfoil surfaces of each of said buckets and a manifold located in the tip region of each of said buckets in flow communication with the radially outer ends of cooling channels of the given bucket whereby coolant enters into, proceeds through and exits from cooling channels into said manifold, the improvement comprising:

(a) a liquid trap disposed in the tip region of said bucket radially outward from and in communication with said manifold;

(b) an orifice disposed at the tip of said bucket in communication with said liquid trap for the discharge of liquid coolant from said manifold in a radially outward direction; and

(c) conduit means disposed in communication with said manifold to accommodate vapor coolant flow therefrom.

4,111,605

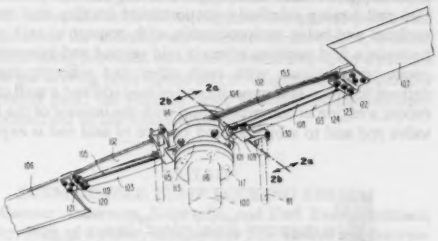
COMPOSITE HINGELESS ROTOR HUB FOR ROTARY WING AIRCRAFT

Stephan Roman, Downingtown, and Richard J. Spitko, Aston, both of Pa., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 16, 1976, Ser. No. 751,121
Int. Cl.[2] B64C *27/38*
U.S. Cl. 416—141 **20 Claims**

1. In a rotary wing aircraft assembly including a rotor blade and a generally centrally located hub, apparatus for mounting the rotor blade to the hub comprising:

a pair of spaced-apart strap members, each being respectively connected to said rotor blade and said hub, and being substantially parallel to each other therebetween, with each of said strap members comprising an open beam of thin walled construction that in transverse cross-section terminates in at least two free edges, said edges being longitudinally extensive throughout substantially the length of the strap members and being located on diametrically opposed portions of the beams such that the strap



members have longitudinal openings facing away from each other, with said strap members of said pair having specific predetermined bending and torsional flexure capabilities and being in unconnected relation to each other between the hub and the blade; and

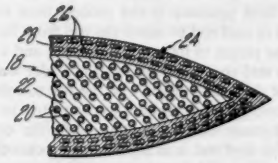
means for changing the pitch of the rotary blade and thereby torsionally flexing said strap members.

4,111,606

COMPOSITE ROTOR BLADE

Karl Michael Prewo, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,668
Int. Cl.[2] F01D *5/14*
U.S. Cl. 416—224 **11 Claims**



1. A rotor blade structure comprising a root section, and an elongated airfoil section formed of a core of high strength, high modulus fibers embedded in a first matrix material and a sheath of high strength, high modulus fibers embedded in a second matrix material, said first matrix material having a lower yield strength than said second matrix material.

4,111,607

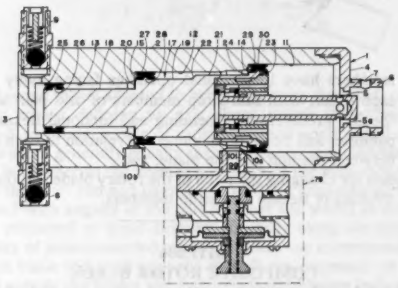
LINEAR HYDRAULIC MOTOR

Chanany Tavor, Carmiel, Israel, assignor to Amiad Systems Ltd., Kibbutz Amiad, Israel

Continuation-in-part of Ser. No. 659,813, Feb. 20, 1976, abandoned, which is a continuation of Ser. No. 437,102, Jan. 28, 1974, Pat. No. 3,939,755. This application Nov. 2, 1976, Ser. No. 738,058
Int. Cl.[2] F04B *49/00, 49/08*
U.S. Cl. 417—46 **8 Claims**

1. A hydraulic motor comprising a cylinder, a stepped piston reciprocatable in said cylinder and having relatively proportioned leading and trailing surfaces, said surfaces together with axially directed surfaces defining, with the cylinder walls, first, second and intermediate cylinder zones, which intermediate cylinder zone is sealed with respect the first zone, valve controlled inlet and outlet ports in said cylinder in communication with said first zone, a water inlet of said cylinder in communication with said intermediate zone, piston wall portions defin-

ing a cylindrical recess opening out into said second zone and passages serving to effect communication between said recess and said second and intermediate zones, a tubular spool valve rod having an aperture adjacent one end thereof and formed adjacent an opposite end thereof with a pair of axially spaced apart flanges fitting slidingly into said cylindrical recess, said rod having formed thereon an outwardly directed abutment located intermediate said flanges and said one end of said rod, said rod having relatively proportioned leading and trailing surfaces and being reciprocatable with respect to said piston between a first position wherein said second and intermediate zones communicate with each other and wherein there is defined between said opposite end of said rod and a wall of said recess, a region in communication with the interior of the spool valve rod and to which an end surface of said rod is exposed,



and a second position wherein said second and intermediate zones are sealed with respect to each other; said rod extending sealing and slidably through a cylinder wall and being displaceable with respect to said cylinder between a first location wherein the rod aperture communicates with said second zone for causing fluid pressure in the second zone to act on said opposite end of said rod to move the rod from its first position relative to the piston to its second position, and a second location wherein said abutment abuts said cylinder wall for causing movement of the piston relative to the rod to relocate the rod from its second position relative to the piston to its first position, said aperture communicating with the outside of the cylinder when said rod is in said second location and in locations intermediate said first and second locations for venting fluid in the second zone.

4,111,608

GAS LIFT SYSTEM

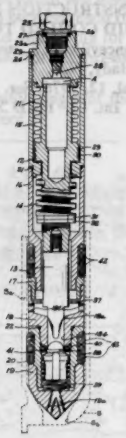
J. Kelly Elliott, Baytown, and Douglas W. Crawford, Houston, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 565,349, Apr. 7, 1975, abandoned, which is a continuation of Ser. No. 195,935, Nov. 5, 1971, abandoned, which is a division of Ser. No. 25,985, Apr. 6, 1970, Pat. No. 3,646,953. This application Feb. 23, 1976, Ser. No. 660,088

Int. Cl.[2] F04F *1/20*

U.S. Cl. 417—112 **3 Claims**

1. A continuous flow gas lift system for use in a well having tubing through which well fluids are elevated and casing into which injection gas is supplied, comprising: fluid operated unloading valve means on said tubing for conveying fluids from said casing to said tubing during initiation of flow from the well, said unloading valve means opening in response to a predetermined level of pressure in said tubing and closing when said pressure declines to another predetermined level; and casing pressure controlled operating valve means on said tubing below said unloading valve means enabling injection of gas supplied to said casing into a column of fluids contained in said tubing, said operating valve means including a valve body having a flow path extending between inlet means in communication with said casing and outlet means in communication with said tubing, and closure means including seat means and movable valve stem means arranged whereby said flow path is closed by moving said valve stem means into sealing contact with said seat means, said valve stem means having a coun-



toured surface thereon cooperating with said seat means whereby movement of said valve stem means alters the effective size of said flow path in a linear relationship with the pressure of gas at said inlet means for regulating the rate of gas flow through said flow path.

4,111,609

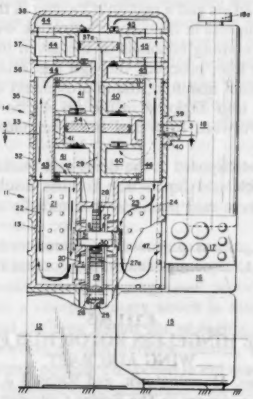
MULTISTAGE GAS COMPRESSOR

Anton Braun, 6421 Warren Ave., Edina, Minn. 55435

Continuation of Ser. No. 624,846, Oct. 28, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,687

Int. Cl.[2] F04B *23/06*

U.S. Cl. 417—243 **5 Claims**



1. A compact multistage gas compressor comprising a substantially box-shaped housing, a plurality of stacked housing sections of substantially equal cross-sectional areas and with axially aligned first and second compressor cylinders therein, pistons in said cylinders for compressing gas in said cylinders, power-driven actuating means in said housing axially spaced from and for operating said pistons, driving means between said actuating means and said pistons, first and second high-

pressure gas receiving chambers alongside of and on opposite sides of said driving means, each of said chambers having a single and strong partition wall between it and said driving means, a gas inlet in said housing leading to said first cylinder, a relatively large first gas passageway in said housing extending between said first cylinder and said first chamber, a relatively large second gas passageway extending through axially aligned openings in said housing sections between said first chamber and said second cylinder, a relatively large third gas passageway extending from said second cylinder through axially aligned openings in said housing sections to said second chamber, an outlet from said second chamber, and liquid-type cooling units mounted in each of said chambers.

4,111,610

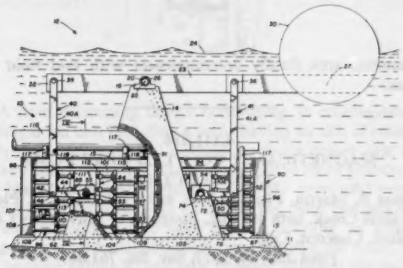
WAVE-POWERED, PIVOTED FLOAT PUMPING SYSTEM WITH INCREASING OPPOSITION TO EXTREME MOVEMENT OF LEVER ARM

Henry C. Brown, 410 Crusader Dr., Dallas, Tex. 75221

Continuation-in-part of Ser. No. 475,453, Jun. 3, 1974, abandoned. This application Aug. 19, 1977, Ser. No. 826,074

Int. Cl.[2] F04B *17/00, 35/00*

U.S. Cl. 417—332 **3 Claims**



1. A wave powered pumping system adapted for use within a body of water subject to wave motion and adapted to be secured to a foundation fixedly mounted beneath the water surface, the system comprising:

a support structure affixed to the foundation and extending upwardly therefrom toward the water surface;

a beam pivotally connected to the upwardly extending support structure adjacent its upper end for pivotal movement, about a horizontal pivot axis, between first and second extremes of pivotal movement;

a float structure connected to the beam at a location thereon spaced from the pivot axis and adapted to float upon the body of water for causing pivotal movement of the beam as the float structure rises and falls upon the water surface during normal wave motion, the beam having horizontal extension from the pivot axis;

fluid pumping means, having an outlet and having an inlet having communication with the body of water, immovably located relative to the foundation at a location continuously below the surface of the body of water, the fluid pumping means comprising at least one cylinder having a piston reciprocally mounted therein;

power transmitting means, comprising at least one walking beam structure rotatably connected to the beam at a location spaced from the pivot axis and extending downwardly from the beam, below the water surface and operatively connected to the at least one piston of the pumping means, for reciprocally driving the piston; and

non-resilient means, including the power transmitting means, for opposing movement of the beam toward its first and, alternatively, toward its second extreme of pivotal movement with a force which increases as the beam approaches its first, and alternatively, its second extreme of pivotal movement, the increase in force being sufficient to prevent movement of the beam to a respective one of its positional extremes, the means opposing movement of the beam comprising means providing relatively little resistance to reciprocal movement of the float through a mid-range which corresponds to movement of the float upon waves naturally occurring during moderate weather conditions, the means opposing movement of the beam to its positional extremes comprising a rotatable crank assembly having a pinion gear, a driving plate means being provided in connection with the at least one reciprocal piston and mounted for slideable movement with the piston, a linear rack being provided mounted horizontally upon a portion of the driving plate means and drivingly engaged with the pinion gear, the walking beam structure being drivingly connected to the crank assembly.

4,111,611

SUBMERSIBLE PUMP LOCKING SYSTEM

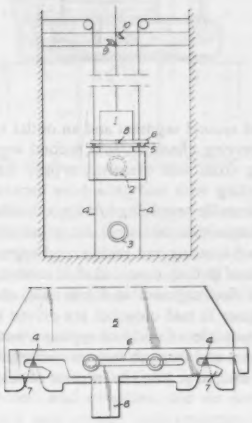
Karl-Gunnar Andersson, Sodertalje, and Karl Evert Sjostrand, Taby, both of Sweden, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,199

Claims priority, application Sweden, Oct. 8, 1976, 7611187

Int. Cl.[2] F04B *17/00*

U.S. Cl. 417- -360 **5 Claims**



1. A device for automatically connecting a submersible pump to a guide disposed in a pumping station, comprising:

at least one guiding means mounted to said pump for engaging the guide;

movable locking means associated with said guiding means for cooperating therewith to lock the guide in the guiding means when in a locked position and to allow for disconnection of the pump from the guide in an unlocked position; and

operating cams mounted in said pumping station at a level somewhat below the upper end of the guide for engaging the locking means to automatically move the locking means to a locked and unlocked position respectively when the pump unit is lowered and raised.

4,111,612

HERMETIC COMPRESSOR LUBRICATION SYSTEM

Andrew Waclaw Paczuski, Bristol, Tenn., assignor to Sundstrand Corporation, Rockford, Ill.

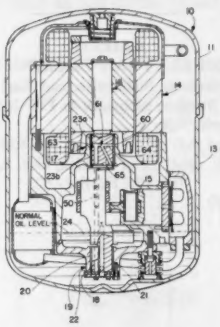
Filed Apr. 7, 1977, Ser. No. 785,713

Int. Cl.[2] F04B *17/00, 39/02*

U.S. Cl. 417—372 **6 Claims**

1. In a hermetic refrigerant compressor including, a hermetically sealed housing, an electric motor mounted within said housing, a crankshaft connected to and depending from said

motor to extend into a sump of lubricant within the housing, a bearing support in said housing and including a space defining a lubricant-receiving chamber for adjacent bearing surfaces within said support, means supported within said housing and drivingly connected with said crankshaft for compressing refrigerant gases from within said housing, the improvement in said compressor comprising a lubrication system for supplying lubricant to said chamber including, a cross-bore formed diametrically through said shaft and having first and second segments extending in generally opposite directions and communicating directly with said lubricant-receiving chamber, said first segment having a radial length shorter than the radial



length of said second segment and an outlet opening into said lubricant-receiving chamber, said second segment having an inlet opening from said chamber, supply means within said shaft intersecting with said cross-bore between said first and second segments for supplying lubricant to said cross-bore, and a venting duct within said shaft communicating between the interior of said housing and said second segment intermediate the ends thereof so that, as said shaft is rotated, lubricant flows through said first segment and into said chamber whereby refrigerant gases in said chamber are driven by said lubricant away from the outlet of said first segment, into the inlet of said second segment and through said second segment to said venting duct for discharge into the interior of said housing.

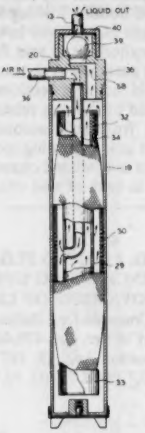
4,111,613

BLADDER ACTUATED PUMPING SYSTEM

Charles Richard Sperry, Wilton, Conn., assignor to Sealed Air Corporation, Saddle Brook, N.J.

Filed Feb. 22, 1977, Ser. No. 770,527
Int. Cl.[2] F04B *43/10, 45/06*
U.S. Cl. 417—394 **9 Claims**

1. A pump comprising a tubular casing, fluid inlet means at one end of said casing, fluid outlet means at the other end of said casing, a tubular support member positioned in said casing in substantial axial alignment therewith, an elastic pumping member disposed about the outer surface of said tubular support member, pump means for expanding and contracting said elastic pumping member so that it alternately expands and seals against the inner surface of said tubular casing and contracts back to said tubular support member, and a fluid flow path through said tubular support member which connects said inlet means to said outlet means, said fluid flow path being fluidly connected to a volumetric area which is partially defined by at least a portion of the exterior of said elastic pumping member disposed closest to said one end of said casing and which



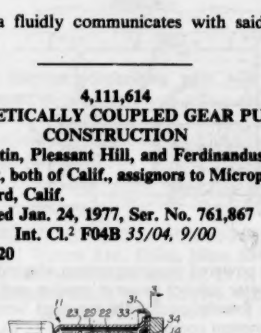
volumetric area fluidly communicates with said fluid inlet means.

4,111,614

MAGNETICALLY COUPLED GEAR PUMP CONSTRUCTION

Thomas B. Martin, Pleasant Hill, and Ferdinandus A. Pieters, Walnut Creek, both of Calif., assignors to Micropump Corporation, Concord, Calif.

Filed Jan. 24, 1977, Ser. No. 761,867
Int. Cl.[2] F04B *35/04, 9/00*
U.S. Cl. 417—420 **6 Claims**



1. A magnetically coupled gear pump comprising an annular drive magnet, a prime mover for rotating said drive magnet, an annular driven magnet, driven magnet mounting means holding said driven magnet in proximity to said drive magnet, a non-magnetic separator cup interposed between said magnets, said cup having a peripheral flange, a pump body formed with a face with a gear cavity recessed into said face, drive and driven gears in said cavity, said body formed with inlet and outlet ports leading from the exterior of said pump body to said cavity on opposite sides of said gears, first and second shafts supported parallel to each other by said body and extending into said cavity and supporting said drive and driven gears for rotation on said shafts, respectively, said first shaft extending beyond said body and also rotatably supporting said driven magnet mounting means, a plate formed with an aperture and supported across said face of said body, said plate being sealed to said body and to said peripheral flange of said separator cup, said plate substantially closing off said cavity and also closing off said separator, said first shaft extending through said aperture and cooperating means on said driven magnet mounting

means and said drive gear whereby, as said drive magnet causes rotation of said driven magnet, said driven magnet rotates said drive gear.

4,111,615

FLUID EXHAUSTING DEVICE

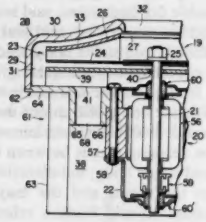
Iwao Watanabe, Kadoma, Japan, assignor to Matsushita Electric Industrial Company, Limited, Japan

Filed Jun. 17, 1976, Ser. No. 697,123

Claims priority, application Japan, Jun. 18, 1975, 50-74854; Sep. 30, 1975, 50-134510[U]; Sep. 30, 1975, 50-134516[U]; Sep. 30, 1975, 50-134520[U]

Int. Cl.² F04B *17/00*

U.S. Cl. 417—423 A **24 Claims**



1. A fluid exhausting device comprising, in combination, a centrifugal fan unit including a rotor having an axis of rotation and formed with a central opening having a center axis substantially coincident with said axis of rotation and a plurality of rotor blades extending radially outwardly from said central opening and a rotor housing enclosing the rotor and having a generally cylindrical side wall portion defining an annular passageway substantially coaxially surrounding the rotor, said rotor housing having a fluid inlet opening adjacent the central opening in the rotor, a driving unit positioned opposite to said fluid inlet opening across said rotor and drivingly connected to the rotor, a housing structure fixedly secured to the rotor housing and enclosing the driving unit for providing a fluid outlet passageway surrounding at least part of the driving unit, the housing structure being in constant communication with said annular passageway in the rotor housing, and formed with at least one opening through which said outlet passageway is vented to the atmosphere, a plurality of stationary guide vanes located between said annular passageway and said outlet passageway and elongated generally radially away from an extension of said axis of rotation of said rotor, said annular passageway having a portion which is in substantially coaxially surrounding relationship to said first guide vanes, and a plurality of second guide vanes located in said outlet passageway immediately downstream of said first guide vanes and extending generally radially about said extension of the axis of rotation of said rotor.

4,111,616

FLEXIBLE WALL PUMP

Andrew Francis Rankin, Pannoo Rd., Lockington, Victoria, Australia

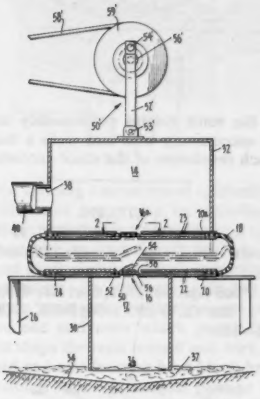
Filed Nov. 16, 1976, Ser. No. 742,525

Int. Cl.² F04B *45/00, 11/00*

U.S. Cl. 417—472 **2 Claims**

1. A sludge pump having a casing defining a variable volume enclosed work chamber having a pair of spaced apart plates forming a separation therebetween, each of said plates being one of two closely spaced circular plate segments; and an endless flexible wall portion being formed broader than said separation formed by said plates and joining the respective edges of said plates said flexible wall portion being clamped between said plate segments; said plates as joined defining a U-shaped cross-section between closest points on the peripheral edges of said respective plates; pressure sensitive one-way inlet and outlet ports disposed in said respective plates, which ports are opposite to one another being urged into position by flexible flaps seated between the respective sets of said plate segments; said ports providing fluid-flow communication between said work chamber and respective inlet and outlet chambers disposed exteriorly of the work chamber;

means acting on said casing for periodically varying the volume of the work chamber; said pump being further defined by: said inlet and outlet chambers being bounded by respective first and second wall structures secured to associated structures of said plates, said first wall structure extending directly to an opening opposite said respective plate and said inlet port therein, whereby said opening and



said inlet and outlet ports are substantially in line, and the outlet chamber being wholly enclosed except for an outlet opening therefrom, being so disposed relative to the respective plate to which the second wall structure is secured, to form an air dome outwardly of said outlet opening; and

wherein said means acting on said casing being coupled to the center of the said second wall structure is in line with said one-way inlet and outlet ports for rocking back and forth said second wall structure, said air dome and said plate to which said second wall structure is attached, about a horizontal axis while periodically varying the volume of said work chamber.

4,111,617

ROTARY PISTON MECHANISM

Richard A. Gale, Main St., Vineyard Haven, Mass. 02568, and Donald L. Kahl, 62 Pleasant Hill Dr., Scituate, Mass. 02066

Filed Sep. 25, 1975, Ser. No. 616,672

Int. Cl.² F02B *53/00*

U.S. Cl. 418—61 B **30 Claims**

1. A rotary piston mechanism for internal combustion engines, fluid motors, pumps and the like comprising,

an outer body having means forming a chamber therein,

a rotor confined in said chamber, said chamber having a chamber axis circumscribed by curved side walls,

said rotor being generally elongated, and having a rotor axis centrally located therein and parallel to said chamber axis,

a rotor carrier rotatably supported by the outer body for rotation on the chamber axis,

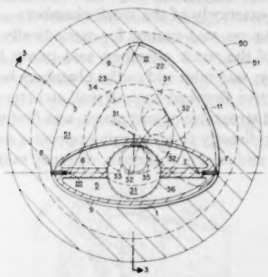
a first axle rotatably carried by the rotor carrier eccentric of the chamber axis and parallel thereto,

first gear means acting between the first axle and the outer body for rotating said axle when the rotor carrier rotates,

a second axle attached to and eccentric with respect to the first axle,

the rotor being rotatably carried on the second axle concentric with the rotor axis and

second gear means acting between the rotor and the rotor carrier for rotating the rotor on the second axle,



whereby the rotor rotates continuously in one direction, closing successively with said walls a multitude of times with each revolution of the rotor carriers.

4,111,618

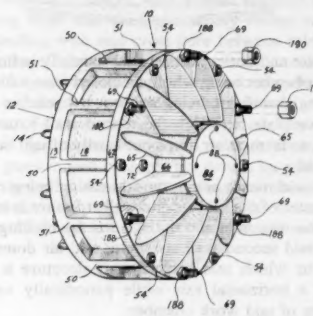
HYDRAULIC WHEEL II

Olida Thibault, 390 De la Briquade, Blainville, Terr. P.Q., Canada (J7C 2C8)

Filed Apr. 23, 1976, Ser. No. 679,652

Int. Cl.[2] F03C *3/00*; B60K *7/00*

U.S. Cl. 418—152 **18 Claims**



1. A light weight fluid motor having reversed position vanes revolving with and inside a cylindrical plastic rotor means around an inclosed plastic stator; said rotor means being supported on a basic stationary metal spindle by frictionless bearing means; said spindle affixing interiorly said stator releasably; said spindle being adapted to cycle powering fluid in and out of said stator; said stator having at least two shallow arcuated fluid power chambers molded on its circumference; both sloping ends of said chambers communicating respectively with a pressure feeding first major manifold and a drooping pressure exhausting second major manifold; said slopes having fluid pressure control means; said major manifolds being in communications, through said spindle, with an exterior fluid power generating source; said rotor means comprising a cylindrical plastic housing box enclosing an annular plastic power ring in floating positive engagement with by releasable driving means; the bottom of said box having inserted reinforcing tubes, both ends of which communicating with the interior of said housing box; said power ring encircling the camming contour of said stator body with minimal operable clearance; the inside periphery of said power ring being copulated by a plurality of radially slidable plastic vanes in cooperative slots; said vanes being biased inwardly in liquid sealing contact with said camming contour by resilient means; a plurality of powering vanes, descending successively in the power chambers, being repulsed in sliding trajectory by incoming pressurized powering fluid; said powering vanes relaxing when approaching the ascending slopes to expel out drooping pressure fluid in said exhausting manifold; the other vanes, sliding idlingly on the major camming arcs, serving as liquid sealing barriers between the adjacent power chambers; said power ring having collecting chambers for the leak-off fluid between the vanes and their slots; two annular plastic seal plates serving as, constant lubricated contact, side walls for said power chambers; said seal plates being positioned as pistons in cooperative pressure chambers molded in both end plates of said housing box; said seal plates overlapping partially both faces of said power ring and stator body with clasping force supplied by resilient and fluid pressure means inside said pressure chambers; said seal plates being in loose positive engagement with both housing end plates by releasable driving means; said seal plates rotating with the housing and the power ring; said seal plates sliding on a portion of both faces of said stator body; said pressure means inside the pressure chambers communicating with said power chambers through feeding minor manifolds embedded in the plastic mass of said stator body; said minor manifolds communicating with said major manifolds; said minor manifolds feeding also said friction relaxing means between the rubbed faces of said seal plates and stator body; uni-directional valves being interposed between the minor and the major manifolds to control flow directions to said friction relaxing means; said wheel motor having equal efficiency in both directions of rotation and capable of dynamic braking; a scavenging system means for exiting interior leak-off fluid out of said motor; said leak-off lubricating the interior moving parts; sealing means between said spindle and motor housing preventing exterior spoilage of said leak-off, being recuperable by recycling means.

4,111,619

APPARATUS FOR PREPARING TREAD BANDS FOR USE IN TIRE RETREADING

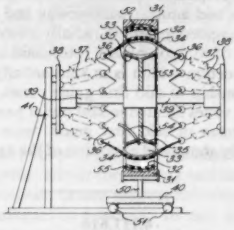
Jan Herbert Farquharson Kent, St. Martin, Jersey, Channel Islands, assignor to Beverly Limited, England

Filed Apr. 21, 1977, Ser. No. 789,621

Claims priority, application United Kingdom, Apr. 23, 1976, 789621/76

Int. Cl.[2] B29H *5/02*

U.S. Cl. 425—43 **12 Claims**



1. A sinker unit for preparing an annular unvulcanised tread band from a strip of unvulcanised tread material, comprising

(a) an annular mould for supporting the strip of tread material on the inner surface of the mould

(b) an expandable annular sinker member located inwardly of the mould for forcing the strip of tread material against the inner surface of the mould, the sinker member comprising a ring of resilient material which is capable of uniform circumferential expansion and contraction over its whole length, the ring including an annular central zone for contacting the strip of tread material and a side wall extending outwardly from each side of the central zone with each side wall being resiliently biassed outwardly, and

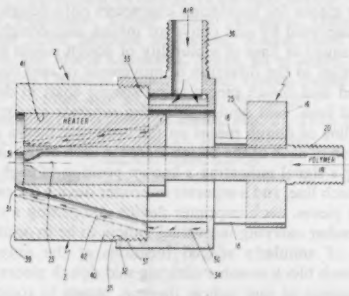
(c) means located radially inwardly of the sinker member for forcing the sinker member against the strip of tread material, the sinker member being maintained in a tensioned condition, by means of the resilient bias, during its movement against the strip.

4,111,620

HEATED SPRAY SPINNING NOZZLE AND ATTENUATION SYSTEM

Victor J. Lin, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jun. 1, 1977, Ser. No. 802,384
Int. Cl.[2] D01D *5/12*
U.S. Cl. 425—66 **8 Claims**



1. A spray spinning nozzle for producing a substantially continuous filament from molten synthetic resinous material comprising:

nozzle means for advancing the material to be shaped into a filament, having an axis, a first end, a second end and a peripheral surface and including

an extrusion orifice for shaping the filament, positioned at the first end coaxially with respect to the axis,

mounting means at the second end for connecting the nozzle means in fluid communication with a source of the material, and

a plurality of circumferentially spaced recesses in the peripheral surface, each being generally parallel to the axis;

attenuating means for supplying at least three gaseous jets spaced about the axis, each jet being oriented to converge on the axis at the same point, the attenuating means being coaxial with the axis and including an annular manifold defining a plenum, and a jet housing extending forwardly from the manifold and including

an inner peripheral wall conforming to the peripheral surface and having a plurality of complimentary longitudinal recesses correspondingly positioned with the plurality of circumferentially spaced recesses and cooperating therewith to define a plurality of pockets, and

a plurality of spaced jet passages communicating with the plenum and aligned to converge on the axis downstream of the extrusion orifice; and

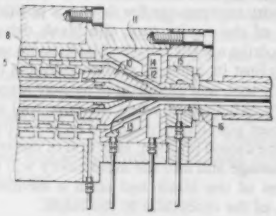
heating means positioned in the plurality of pockets for supplying heat to the nozzle means.

4,111,621

APPARATUS FOR MANUFACTURING ELECTRIC WIRE HAVING A COATED LAYER OF CROSS LINKED SYNTHETIC RESINOUS MATERIAL

Kanji Otani, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 16, 1976, Ser. No. 697,095
Claims priority, application Japan, Jun. 17, 1975, 50-73921
Int. Cl.[2] B29F *3/10*; B29C *1/04*
U.S. Cl. 425—97 **6 Claims**



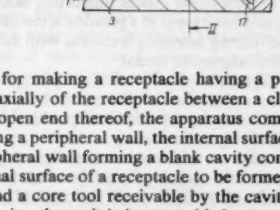
1. Apparatus for forming a cross linked synthetic resin coating on a conducting wire, comprising, an extruding means for extruding a synthetic resin having a crosslinking agent therein onto a conducting wire passing therethrough, a screw head and a forming head block positioned at the end of said extruder to form a conical passage for said resin extruded by said extruder, a forming die having a cylindrical passage positioned to receive said wire and said resin which passes through said conical passage to shape the resin around said wire, at least one of said screw head and said forming head block having a projection which extends into said conical passage to form an orifice wherein the temperature of said resin is raised to assist the cross linking reaction, and a cross linking reaction pipe positioned downstream of said forming die for receiving said wire and resin coating.

4,111,622

PRODUCTION OF CONTAINERS

Brian Leo Chudleigh Sutch, Thames Ditton, England, assignor to Airfix Industries Limited, London, England

Filed Dec. 10, 1976, Ser. No. 749,340
Int. Cl.[2] B29D *3/00*
U.S. Cl. 425—112 **10 Claims**



1. Apparatus for making a receptacle having a peripheral wall extending axially of the receptacle between a closed end portion and an open end thereof, the apparatus comprising a cavity tool having a peripheral wall, the internal surface of said cavity tool peripheral wall forming a blank cavity corresponding to the external surface of a receptacle to be formed therein from a blank, and a core tool receivable by the cavity tool to form a mould cavity, the tools being movable between an open position and a closed position such that when the tools are in the closed position, a blank placed in the cavity tool is so formed that two juxtaposed edges extending axially of the cavity tool will be seamed upon injection of material into the mould cavity, the cavity tool including a passage in the peripheral wall of the cavity tool, said passage extending axially

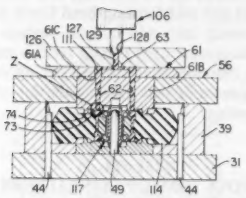
relative to the cavity tool peripheral wall internal surface a length at least as great as the axial extent of a blank formed therein and being provided with an entrance remote from the internal surface of the cavity tool peripheral wall and an exit at the internal surface of the cavity tool peripheral wall, an obturator operatively associated with the cavity tool passage and movable between an open and closed position such that the obturator forms a part of the internal surface of the cavity when in the closed position, means operatively associated with the cavity tool passage entrance for positioning a blank to be driven into the blank cavity of the cavity tool, blank drive means operatively associated with the cavity tool and movable into the cavity tool passage for driving a positioned blank into the cavity of the cavity tool, the blank drive means being operable to drive a blank into the blank cavity where it remains confined against its inherent resilience by the internal surface of the cavity tool, and an injection passage associated with the mold cavity, whereafter, when the core tool and cavity tool are in a closed position forming the mold cavity and the obturator is in the closed position, injection of material through the injection passage and into the mold cavity will seam the juxtaposed edges of the blank and seam a member forming the closed end of the receptacle to the blank.

4,111,623

APPARATUS FOR ASSEMBLING BEARING UNIT IN A WHEEL

John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Filed Sep. 16, 1976, Ser. No. 723,926
Int. Cl.[2] B29F *1/10*
U.S. Cl. 425—129 R **10 Claims**



1. In an apparatus for use in assemblying a bearing assembly in a wheel having a hole in the center thereof of a diameter greater than the outer diameter of said bearing assembly, said bearing assembly including an axle, a sleeve spaced radially outwardly from said axle and having at least a small amount of resiliency and bearing means positioned between said axle and said sleeve to facilitate a relative rotation between said axle and said sleeve, the improvement comprising:

mold means having a bottom part with means defining a cavity therein and a cover part movable between opened and closed position relative to said cavity;

first alignment means defining a central axis in said cavity, said first alignment means supporting said bearing assembly in said cavity and in a position wherein the central axis of said bearing assembly is coaxial with said central axis of said first alignment means;

second alignment means in said cavity supporting said wheel to effect a placement of the center of the outer diameter of said wheel in coaxial relationship with said central axis of said first alignment means;

nozzle means on said mold means aligned with the spacing between said sleeve of said bearing assembly and the internal wall surface of said hole in said wheel when said cover means is in said closed position;

means on said bottom part and said cover part of said mold means effecting an axial compression of said resilient sleeve of said bearing assembly in response to a closing of said cover part to form an annular seal between said sleeve and said mold means at both axial ends thereof; and

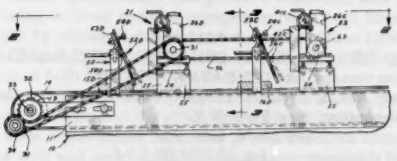
supply means supplying a moldable, synthetic resin material to said nozzle means and the spacing to effect, upon a congealing of said moldable, synthetic resin material, a securement of said bearing assembly in said hole in said wheel, said seal preventing a flow of said resin material therepast thereby maintaining said bearing means free of contamination by said resin material.

4,111,624

DOUGH PIECE IMPRINTER AND CONTROLS THEREFORE

Douglas R. Hanson, 1720-9th Ave. So., Anoka, Minn. 55303

Filed Oct. 28, 1976, Ser. No. 736,382
Int. Cl.[2] A21C *11/02*
U.S. Cl. 425—135 **10 Claims**



1. A dough imprinting device for use in combination with a conveyor means for imprinting characters onto dough pieces being transported by said conveyor means, said dough pieces being arranged in lines of a plurality of dough pieces substantially parallel to the direction of movement of said conveyor means and said dough pieces being spaced apart in direction along said lines, said device including separate sensor means for each line of dough pieces on the conveyor means sensing the position of each of the dough pieces in each of the lines and providing a signal indicating a known position of each dough piece in each line, and a separate imprinter device for each line of dough pieces, each imprinter device comprising a rotating block member carrying individual indicia to be imprinted at a plurality of annularly spaced locations at the outer edge thereof, each block member clearing said dough pieces except at the location of said indicia thereon, means to rotationally mount and frictionally drive each block member about a central axis, separate means to restrain rotational movement of each block member at a plurality of rotational positions each of which is a position with the block member clearing dough pieces on the conveyor means, said separate means to restrain being movable to a position to permit rotational movement of its associated block member, and control means responsive to receipt of said signal from the respective corresponding sensor means to move each means to restrain to position to permit its associated block member to rotate only sufficiently far for one of said indicia to imprint a dough piece sensed by the sensor means for that block member subsequent to receiving a signal from the respective sensor means and to release said means to restrain to return it to position restraining said block member prior to the time second indicia on the associated block member moves to an imprinting position.

4,111,625

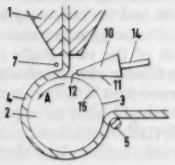
POLYMERIC FILM PRODUCTION

Timothy Alan Remmington, Hertford, England, and William Robinson, Dumfries, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 599,349, Jul. 28, 1975, Pat. No. 4,038,354. This application Dec. 8, 1976, Ser. No. 748,404
Claims priority, application United Kingdom, Aug. 7, 1974, 34781/74
Int. Cl.[2] B29D *7/22*
U.S. Cl. 425—174.8 E **11 Claims**

1. An apparatus for extruding and quenching a polymeric film, which comprises an electrically earthed movable casting surface arranged to receive extruded molten polymeric film, said casting surface moving at a linear speed greater than the

speed at which bubbles can be prevented from being entrapped between the molten film and the casting surface when electrostatic pinning is employed alone, an electrostatic pinning electrode supported in spaced relation to the path of the molten film in the proximity of or prior to the region of first contact of



the film with the casting surface, and means adjacent said casting surface for applying suction to the space bounded by the path of the molten film prior to its first contact with the casting surface and that part of the casting surface prior to the region of first contact with the molten film.

4,111,626

POWDER COMPACTING MACHINE

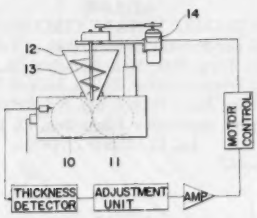
Yoshiro Funakoshi, Kyoto; Tatsuo Asogawa, Osaka; Eiichi Satake, Suita; Shimesu Motoyama, Asaka; Shuri Yamada, Tokyo, and Morio Kakukawa, Tokyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 29, 1976, Ser. No. 653,627

Claims priority, application Japan, Feb. 27, 1975, 50-24816; Apr. 21, 1975, 50-48892; Jun. 27, 1975, 50-80341

Int. Cl.[2] B29C *15/00*

U.S. Cl. 425—203 **5 Claims**



1. A powder compacting machine for manufacturing a compressed product fom powdery material which comprises:

first and second compressing rolls, one of said first and second compressing rolls being supported in position for movement of the periphery thereof toward and away from the periphery of the other of said first and second compressing rolls, one of said first and second compressing rolls having an outer peripheral surface having a complementary shape to that of the other of said first and second compressing rolls such that a mass of the powdery material passing through the gap defined between said first and second compressing rolls will receive a substantially uniform compressive force necesssary to compress said powdery material, the outer peripheral surface of one of said first and second compressing rolls has a radially inwardly extending annular recess intermediate the width of said one of said first and second compressing rolls having a depth of from 0.5 to 10mm, said recess being defined by a pair of opposed side walls each being inclined at a predetermined obtuse angle of from 95° to 160° to the bottom of said recess, the other of said first and second compressing rolls having a radially outwardly extending rim on the outer peripheral surface thereof having a shape complementary to the shape of said annular recess, the surfaces defining said annular recess and the outer surfaces of said rim cooperating with each other to define said gap, and the material of the rolls at least at said outer peripheral surfaces of said rolls being incompressible under the forces generated on the powder material being compacted;

means coupled to said first and second compressing rolls for driving said first and second compressing rolls in opposite directions to each other so that the mass of the powdery material falling downwardly will be fed further downwardly through the gap between said first and second compressing rolls;

a hopper assembly above said rolls and having a built-in scew feeder for accommodating said powdery material and for positively feeding the mass of the powdery material in a downward direction towards the gap between siad first and second compressing rolls;

means between said hopper assembly and said rolls for substantially uniformly dispensing the mass of powdery material falling from said hopper assembly towards said gap between said first and second compressing rolls over the width of said gap.

4,111,627

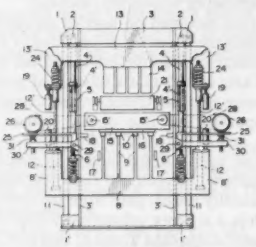
APPARATUS FOR MOLDING CONCRETE-BLOCKS

Yutaka Kitahara, Takahashi, Japan, assignor to Kabushiki Kaisha Tiger Machine Seisakusho, Takahashi, Japan

Filed Mar. 29, 1977, Ser. No. 782,382

Int. Cl.[2] B28B *3/04*

U.S. Cl. 425—421 **18 Claims**



1. An apparatus for molding concrete-blocks comprising:

a plurality of guide rods secured to an upper support member and a lower support member, said support members being fixedly mounted on a pair of side plates of said apparatus;

a plurality of upper cylinders, each of which includes a piston rod, and which are positioned adjacent to said guide rods and suspended vertically, each of said plurality of upper cylinders including an upper end member being pivotally mounted on said upper support member;

a plurality of suspension members corresponding in number to said piston rods of said upper cylinders and being mounted on a table frame through spring means, wherein a lower end of each of said piston rods of said upper cylinders is connected with each of said suspension members, thereby suspending said table frame;

a plurality of lower cylinders, each of which includes a piston rod, and which are mounted on said table frame through support members thereon;

said plurality of lower cylinders being positioned in parallel with said guide rods, and being disposed on each side of a press frame with said piston rods of said lower cylinders being connected to said press frame through spring means;

a molding box between said table frame and said press frame;

at least one operation limiting member fixed on each side of said table frame which corresponds in number and position to and faces said operation limiting member fixed on each side of said press frame.

4,111,628
APPARATUS FOR VULCANIZING CONTINUOUS LENGTHS OF FLEXIBLE MATERIAL

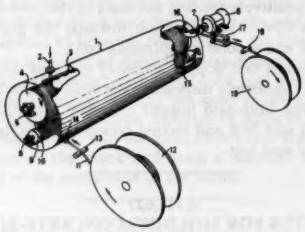
Challen E. Taylor, Portadown, Northern Ireland, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 664,606, Mar. 8, 1976, Pat. No. 4,053,550, which is a continuation-in-part of Ser. No. 506,386, Sep. 16, 1974, abandoned. This application Jul. 5, 1977, Ser. No. 817,090

Claims priority, application United Kingdom, Oct. 29, 1973, 506386/73

Int. Cl.[2] B29H *5/01;* **B29C** *25/00;* **B29H** *5/28*

U.S. Cl. 425—445 **4 Claims**



1. Apparatus for vulcanizing a continuous length of unvulcanized elastomeric or plastomeric material comprising:

a closed chamber having an input port for receiving unvulcanized material and an exit port for discharging vulcanized material while maintaining vulcanization pressure and temperature within the chamber;

a pair of rolls mounted on parallel spaced-apart horizontal axes within the chamber, at least one of the rolls having a larger diameter than the other and the distance between the roll axes is such that a substantial portion of the material passing into the chamber and carried by the rolls is self-supporting and free of any contact with either roll surface, and at least one of the rolls comprises a substantially contoured surface such as to position convolutions of the material thereon and cause the material to move in a substantially helical path from the entry port to the exit port while it is being vulcanized within the chamber; and

a drive motor connected to one of said rolls to effect rotation of the roll and movement of the hose through the chamber.

4,111,629
CLOSURE DEVICE FOR AN INJECTION MOLDING MACHINE OR INJECTION PRESS

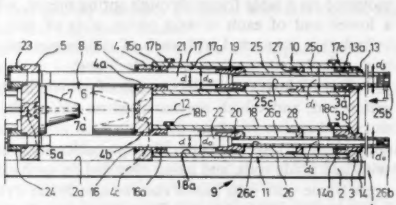
Thomas Nussbaumer, Zug, Switzerland, assignor to Patent & Inventions Ltd., Zug, Switzerland

Filed Apr. 11, 1977, Ser. No. 786,685

Claims priority, application Switzerland, Apr. 9, 1976, 4506/76

Int. Cl.[2] B29F *1/06;* **B30B** *1/00*

U.S. Cl. 425—451.2 **6 Claims**



1. In a closing unit for an injection moulding machine or transfer moulding press with a frame (1), a first tool carrier (4) fixedly connected therewith, a second displaceable tool carrier (5) and hydraulic displacing devices (10, 11), which are eccentrically arranged with respect to the tool carriers (4, 5) and of which each displacing device (10, 11) possesses a hollow cylinder (17, 18) fastened to the frame (1) and a piston (19, 20), which is displaceably guided in the hollow cylinder (17, 18), each piston (19, 20) being provided on one side with a first shaft (21, 22) and on the other side with a second shaft (25, 26), wherein the first shafts (21, 22) are arranged in such a manner that they are drawn into the hollow cylinders (17, 18) when the tool carriers (4, 5) are brought nearer to each other, and wherein one each of the two shafts (21, 22, 25, 26) of the pistons (19, 20) is fixedly connected with the second tool carrier (5), the improvement which comprises: that at least two first pistons (19) are provided in respective hollow cylinders (17), the first shaft (21) of each first piston (19) having a smaller diameter than its associated second shaft (25), that at least two second pistons (20) are, provided in respective hollow cylinders (18), the first shaft (22) of each second piston (20) having a greater diameter than its associated second shaft (26), all said first shafts (21, 22) being connected with the second tool carrier (5), each hollow cylinder (17, 18) having an inside diameter (17*a*, 18*a*) greater than the outside diameter of the respective first and second piston (19, 20) associated therewith, the difference between each cylinder diameter and its associated piston diameter defining an annular gap therebetween and a valve closing ring (27, 28) arranged in each hollow cylinder (17, 18) between the inside diameter (17*a*, 18*a*) of such cylinder and the outside diameter of the second shaft (25, 26) of the piston associated with such cylinder, means forming a seal between each valve closing ring (27, 28) and the inside diameter (17*a*, 18*a*) of the cylinder (17, 18) associated therewith and between each valve closing ring (27, 28) and the second shaft (25, 26) of the piston associated with such cylinder, each valve closing ring (27, 28) having valve seat means (27*d*, 28*d*) for sealingly engaging the piston (19, 20) associated therewith.

4,111,630
MULTI-CORE ROTARY CIRCULAR DIE

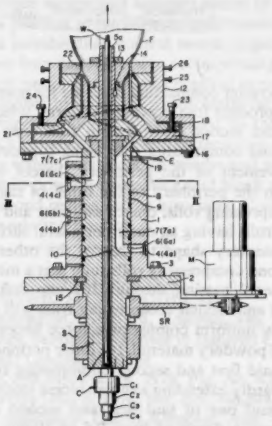
Kozen Shiomi, and Ryoichi Shimizu, both of Yokohama, Japan, assignors to Toyo Soda Manufacturing Co., Ltd. and The Japan Steel Works Limited, Tokyo, both of Japan

Filed Jun. 11, 1976, Ser. No. 695,048

Claims priority, application Japan, Jun. 13, 1975, 50-70946

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—462 **13 Claims**



1. In a multi-core rotary circular die for preparing multilayer tubular film comprising an elongate inner core which is rotatably fitted in an elongate hollow cylindrical body and a plurality of middle cores having at least semi-spherical surfaces affixed to one end of the inner core which are fitted in a circular die, the improvement comprising:

said hollow cylindrical body having molten resin inlets formed radially therein and formed at vertically separated positions;

said inner core having annular resin storage channels therein and communicating with said inlets of said hollow cylindrical body;

said inner core further having longitudinally extending resin passages which correspond to each of the annular storage channels to form corresponding layers of the multi-layer tubular film;

said at least semi-spherical surfaces of said middle cores being connected to a die lip of said die;

said middle cores being adjustably fitted on said one end of said inner core and in the circular die with at least part of the at least semi-spherical surfaces being in contacting relation; and

a slant tapered groove formed on one of the at least semi-spherical surfaces of each of said middle cores, the inner core and the circular die wherein the slant tapered groove is disposed in a plane forming an angle with respect to the longitudinal axis of said inner core.

4,111,631

EXTRUSION DEVICE HAVING INTERMEDIATE EXTRUDER

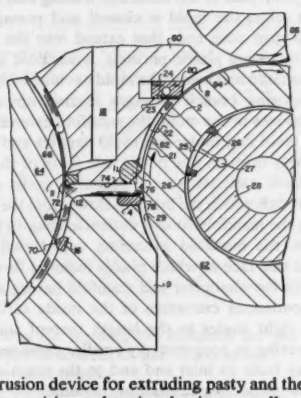
Ernesto Gabbrielli, P.za Giovanni XXIII, Montale (PT), Italy

Division of Ser. No. 722,525, Sep. 13, 1976, abandoned. This application Apr. 14, 1977, Ser. No. 787,500

Claims priority, application Italy, Sep. 17, 1975, 455143 A/75

Int. Cl.[2] B29D *7/14*

U.S. Cl. 425—215 **5 Claims**



1. An extrusion device for extruding pasty and thermoplastic materials, comprising a housing having a wall, a first rotor rotatably mounted in said housing and having a peripheral surface spaced from said wall and defining with said wall a first material infeed passage portion and an extrusion passage portion, a second material infeed passage defined in said wall communicating centrally with and between said first material infeed passage portion and said extrusion passage portion, a first adjustable extrusion device extending into said extrusion passage portion by an amount to extrude material flowing from said first material infeed passage to said extrusion passage portion to cause it to form into a layer spaced from said wall and to move over said first rotor, a second adjustable extrusion device projecting into said extrusion passage downstream of said first adjustable extrusion device, said second adjustable extrusion device and said first adjustable extrusion device being adjusted so that said extrusion passage does not remain full and is thus without pressure, said second adjustable extrusion device being set to effect a build-up of material therebehind and to form a laminate of the buildup material with the layer on said first rotor to effect a boundary layer breaking up of the extruded layers as they pass by said second adjustable extrusion device, and including bypass means associated with said second extrusion device for bypassing a portion of the material accumulated in said extrusion passage behind said second extrusion device.

4,111,632

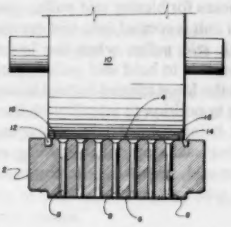
PELLET MILL DIE

Richard Hazen Leaver, Muncy, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jun. 20, 1977, Ser. No. 808,192

Int. Cl.[2] B29F *3/04*

U.S. Cl. 425—382 R **1 Claim**



1. An improved pellet mill apparatus comprising a die having a compression side operatively associated with an extrusion roll means, said die also having a discharge side, a plurality of die holes extending through the die from the compression side to the discharge side, the die holes being arranged in rows, a pair of tapered grooves in the compression side of the die, the grooves being located along the outer row of die holes so that the ends of the extrusion roll means are positioned over the grooves.

4,111,633

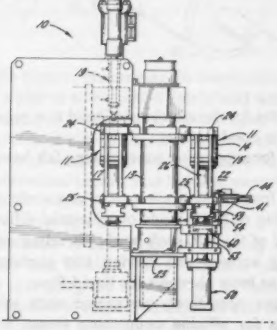
MECHANISM FOR OPENING THE MOLDING DIES OF AN INJECTION MOLDING MACHINE

Kenneth F. Gabrys, Streamwood, Ill., assignor to The Pentaject Corporation, Algonquin, Ill.

Filed Aug. 8, 1977, Ser. No. 822,732

Int. Cl.[2] B30B *9/28, 11/08;* B29G *3/08*

U.S. Cl. 425—451 **5 Claims**



1. A molding machine comprising a fixed support, a turret mounted on said support and adapted to be indexed step-by-step about an upright axis, a series of molding units carried on and spaced angularly around said turret and each adapted to be rotated into and to dwell momentarily in an opening station during indexing of said turret, each of said molding units com-

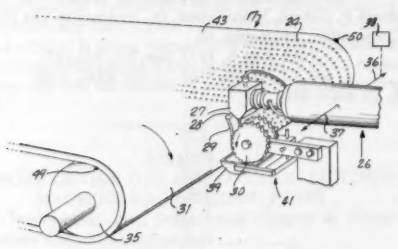
prising upper and lower molds, the lower mold of each unit being disposed in a closed position relative to the upper mold when the unit is first rotated into said opening station and being moved downwardly to an open position relative to said upper mold when the unit dwells in said opening station, an operating member connected to and depending from the lower mold of each unit, a vertically reciprocable puller located on said support in said opening station, said puller being operable to interfit automatically with the operating member of each unit when the unit is rotated into said opening station and the puller is in a first position and being operable to engage said operating member and move said lower mold to said open position when the unit dwells and the puller is shifted downwardly to a second position, means for biasing said puller away from said first position as each unit is rotated into said opening station, a stop engageable with said puller when the latter is in said first position and operable to hold said puller precisely in said first position against the force exerted by said biasing means so as to keep said puller in position to interfit with the operating member of the unit being rotated into said opening station, and means for shifting said stop out of holding engagement with said puller when said unit dwells thereby to enable said puller to move out of said first position.

4,111,634

APPARATUS FOR PRODUCING PAPERMAKER'S FELT

Paul Limbach, Downington, Pa., and Paul Socha, Whitesboro, N.Y., assignors to H. Waterbury & Sons Company, Oriskany, N.Y.

Filed Sep. 16, 1976, Ser. No. 724,103
Int. Cl.² B29D *3/02*
U.S. Cl. 425—505 **10 Claims**



1. Apparatus for the attaching of bead to a paper-making felt comprising in combination:

(a) means for supporting papermaking felt having a working surface;

(b) means for affixing to such a working surface of such a felt a plurality of beads made of a material different from the material of the felt, such beads extending away from said working surface and having top portions which are spaced to form channels for liquid flow;

(1) means operatively associated with said supporting means for affixing comprising means for applying a band of plastic to such a felt;

(2) means operatively associated with said means for applying for inserting at least a portion of such a band into such a felt; and

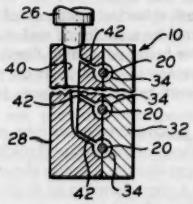
(3) means operatively associated with said applying means for forming at least a portion of such a band into such beads.

4,111,635

MANIFOLD IN SUBSTANTIAL ALIGNMENT WITH PLASTICIZER

Dewey Rainville, Westfield, N.J., assignor to Rainville Company, Inc., Middlesex, N.J.

Filed Apr. 1, 1977, Ser. No. 783,741
Int. Cl.² B29P *23/02*; B29F *1/06*; B29B *1/14*
U.S. Cl. 425—533 **8 Claims**



1. Injection blow-molding apparatus, for use with heat-sensitive molding material, including a multi-cavity mold having a front face and a back face extending lengthwise of the mold between side faces that are at opposite sides of the mold, the mold having two sections, one of which is a relatively fixed section, and the other of which is movable toward and from the fixed section to close and open the mold, recesses in confronting surfaces of the mold sections and in position to form a plurality of mold cavities when the mold is closed, other recesses in the confronting surfaces in position to form passages through the front face of the mold and leading into the respective cavities when the mold is closed, said passages having surfaces that grip core rods that extend into the respective cavities for receiving plastic parisons, a manifold in the fixed section of the mold and below the mold cavities with discharge outlets comprising branch passages leading upward to the respective cavities of the mold, the manifold extending lengthwise of the mold and under the mold cavities and having an inlet that opens through one of the side faces of the mold for receiving plastic material from a discharge outlet of a plasticizer and through which the material flows from the plasticizer and through the manifold to said outlets leading to the respective cavities, the manifold extending substantially at right angles to the side face at which plastic material flows into the manifold from the plasticizer said manifold having a cross-section with continuous curvature of the inside surface of the manifold at right angles to the length thereof and with the manifold tapering to progressively smaller cross-sections as it extends away from its inlet end and to the discharge outlets leading to the respective cavities of the mold.

4,111,636

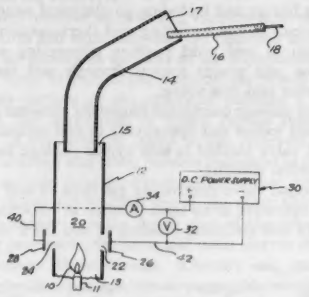
METHOD AND APPARATUS FOR REDUCING POLLUTANT EMISSIONS WHILE INCREASING EFFICIENCY OF COMBUSTION

Leon Goldberg, Potomac, Md., assignor to Lawrence P. Weinberger, Silver Spring, Md., a part interest

Filed Dec. 3, 1976, Ser. No. 747,190
Int. Cl.² F23B *7/00*
U.S. Cl. 431—2 **38 Claims**

1. A method of reducing pollutant emissions from the gaseous products of combustion which comprises separating said pollutant emissions from said gaseous products of combustion

at the combustion zone by applying a unidirectional electric field at the combustion zone to extract matter which has been



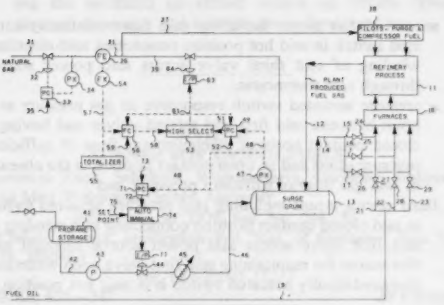
naturally ionized within the flame from said gaseous products of combustion.

4,111,637

CONTROL SYSTEM FOR PLURALITY OF GAS SUPPLIES

William S. Hillman, II, Bountiful, Utah, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 10, 1977, Ser. No. 776,347
Int. Cl.[2] F23N *1/00*
U.S. Cl. 431—12 **20 Claims**



1. Apparatus for meeting the demands for gas utilizing at least two separate sources of gas, comprising:

gas surge vessel means,

means for withdrawing gas from said gas surge vessel means in response to the demand therefor,

first supply means for supplying a first stream of gas,

first conduit means for withdrawing said first stream of gas from said first supply means and for passing at least a portion of said first stream of gas to said gas surge vessel means,

second supply means for supplying a second stream of gas,

second conduit means for passing said second stream of gas from said second supply means to said gas surge vessel means,

means for measuring the gas pressure in said gas surge vessel means and establishing a first measurement signal representative thereof,

means for establishing a first pressure setpoint signal,

first controller means for establishing a first control signal responsive to the difference between said first measurement signal and said first pressure setpoint signal,

means for measuring the flow rate of said first stream of gas through said first conduit means and establishing a second measurement signal representative thereof,

means for establishing a flow rate setpoint signal,

second controller means for establishing a second control signal responsive to the difference between said second measurement signal and said flow rate setpoint signal,

a first valve means operatively positioned in said first conduit means for regulating the flow rate of the portion of said first stream of gas passing to said gas surge vessel means,

signal selection means having said first and second control signals applied to first and second signal inputs thereof, respectively, and adapted to produce an output signal representative of the value of the one of said first and second control signals which would cause said first valve means to open to a greater degree,

means for manipulating said first valve means responsive to said output signal,

means for establishing a second pressure setpoint signal representative of a higher pressure than said first pressure setpoint signal,

third controller means for establishing a third control signal responsive to the difference between said second pressure setpoint signal and a signal representative of the pressure in said gas surge vessel means,

a second valve means operatively positioned so as to control the flow rate of said second stream of gas through said second conduit means,

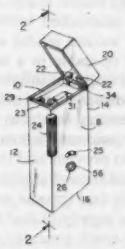
and means for manipulating said second valve means responsive to said third control signal.

4,111,638

CIGARETTE LIGHTER

Henry D. Ostberg, 278 Fountain Rd., Englewood, N.J. 07631

Filed Aug. 17, 1976, Ser. No. 715,119
Int. Cl.[2] F23Q *2/08*
U.S. Cl. 431—13 **2 Claims**

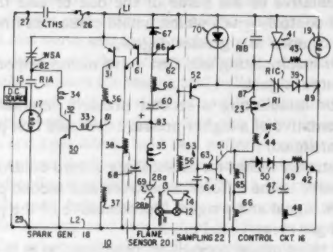


1. A cigarette lighter, comprising, in combination, a lighter casing having a pair of side walls, a pair of end walls, a closed bottom, an open top, a hinged cover for said open top, lighting means for cigarettes in said casing, and means in said casing for presetting the total number of flames desired to be lighted during a predetermined period, said lighting means comprising a ridged cylinder mounted for rotation in said casing and projecting partly through one of said walls, a friction wheel mounted on one end of said cylinder, a spring loaded flint engageable with said friction wheel, mounted in said casing said means for presetting the total number of flames comprising a bearing mounted in a side wall adjacent said one end wall, a hollow shaft received in said bearing, a ratchet gear secured to said shaft and having indicating numerals thereon and provided with an integral stop pin extending from said gear's periphery, said gear being engageable with said ridged cylinder, said hollow shaft having a pair of radially inwardly directed opposed teeth engageably with a setting key having notches engageable with said teeth and a spring member for biasing the ratchet gear against said side wall.

4,111,639
PROVEN PILOT FUEL IGNITION SYSTEM WITH SAMPLING FLAME SENSOR

Russell Byron Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Feb. 25, 1977, Ser. No. 772,079
Int. Cl.[2] F23N 5/12
U.S. Cl. 431—25 **18 Claims**



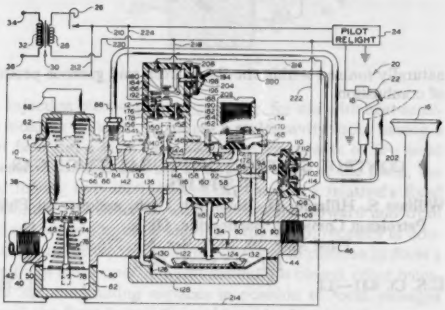
1. In a fuel ignition system including valve means operable when energized to supply fuel to a burner apparatus, an ignition control for controlling the operation of said valve means and for ignition fuel discharged by said burner apparatus, said ignition control comprising activate means for generating an activate signal, spark generating means responsive to said activate signal to generate sparks in the proximity of said burner apparatus, energizing means including control means and timeout means, said control means being responsive to said activate signal to control said valve means to supply fuel to said burner apparatus for ignition by said sparks to establish a flame, and to enable said timeout means to be operable to cause said valve means to interrupt the supply of fuel to said burner apparatus whenever a flame fails to be established within a predetermined interval of time, and flame sensing means including first and second inhibit means and timing means operable when a flame is established within said time interval to control said first and second inhibit means to cause said fuel ignition system to be operable in a sampling mode in which said first inhibit means responds to said timing means to disable said spark generating means during a first period of time and to enable said spark generating means to generate sparks during a second period of time, and said second inhibit means responds to said timing means to prevent said timeout means from operating and in which said second inhibit means responds to said timing means to enable said timeout means to cause said valve means to interrupt the supply of fuel to said burner apparatus in the event that said spark generating means fails to provide sparks during said second period of time.

4,111,640
CYCLING PILOT BURNER CONTROL SYSTEM WITH PRESSURE SWITCH

Walter W. Scott, deceased, late of Willowick, Ohio by Jayne E. Scott, executrix, assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 6, 1977, Ser. No. 794,555
Int. Cl.[2] F23Q 9/08
U.S. Cl. 431—46 **6 Claims**

1. In a gas burner control system,
an electrical power source;
a main burner;
a pilot burner for igniting said main burner;
a space thermostat;
electrically operated ignition means controlled by said thermostat for igniting said pilot burner;
a gas valve device including first and second valves connected fluidically in series;
a thermostatically actuated switch responsive to pilot burner flame and having a cold position in the absence of said pilot burner flame and a hot position when said pilot burner flame exists;
said first valve controlling gas flow to said pilot burner and main burner and including an electrical winding;
first circuit means including said thermostatically actuated switch in said cold position connecting said winding across said power source through said thermostat for opening said first valve;
a bypass passage connected fluidically between said first and second valves and operatively to said second valve;
a third valve located in said bypass passage and having an electrical winding;
said second valve controlling gas flow to said main burner and operative to an open position in response to energizing of said electrical winding of said third valve;

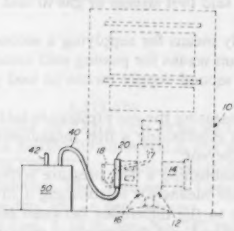


second circuit means including said thermostatically actuated switch in said hot position connecting said electrical winding of said third valve across said power source through said thermostat;
a pressure actuated switch responsive to gas pressure at a point between said first and second valves and having a closed contact position whenever gas flow of sufficient pressure exists and an open contact position in the absence of said gas flow of sufficient pressure; and
third circuit means including said pressure actuated switch in said closed contact position connecting said winding of said first valve across said power source through said thermostat for maintaining said first valve open when said thermostatically actuated switch is in said hot position.

4,111,641
INJECTION SYSTEM FOR FUEL COMBUSTION

Charles F. Morrison, 25 Pea[illegible] St., Malden, Mass. 02148

Continuation-in-part of Ser. No. 664,967, Mar. 8, 1976, Pat. No. 4,009,984. This application Feb. 24, 1977, Ser. No. 771,718
Int. Cl.[2] F23J 7/00
U.S. Cl. 431—4 **15 Claims**



1. An apparatus for adding water vapor to a fossil fuel combustion system, which system has an air intake assembly for introducing a flow of air into the combustion area of the combustion system, which comprises:

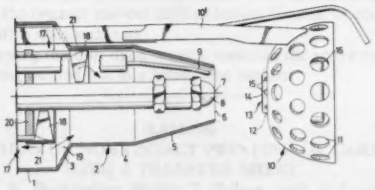
(a) a housing having a reservoir of water disposed therein;
(b) a platform disposed in the housing and in floating engagement with the reservoir;
(c) a tube-like member secured in a vacuum-tight manner to the platform and extending into the reservoir and having a lower air permeable end and an air impermeable upper end, the inner surface of the member, the closed end and the upper surface of the reservoir defining a vacuum chamber, the dimensions of which remain constant regardless of the level of water in the reservoir, the air permeable lower end being entirely immersed in the water of the reservoir, the tube-like member further comprising an inner sleeve and an outer sleeve, the outer sleeve being air impermeable and the lower end of the inner sleeve being air permeable, the inner and outer sleeves defining a flow passage therebetween, whereby air may flow through the flow passage, the air permeable portion of the inner sleeve through the water and into the vacuum chamber;
(d) valve means to seal the vacuum chamber from the ambient environment, said valve means adapted to open when there is a pressure differential between the vacuum chamber and the ambient environment;
(e) means to draw an air stream through the water and into the vacuum chamber to form a saturated air stream;
(f) a conduit secured to the valve means and the fossil fuel combustion system; and,
(g) means to create a pressure differential between the ambient about the housing and the vacuum chamber to draw air through the water and into the vacuum chamber forming the saturated air stream which air stream flows through the valve and into the air intake assembly.

4,111,642

BURNER FOR LIQUID FUELS

Hermann Kopp, Schwendi, Wuerttemberg, Germany, assignor to Max Weishaupt GmbH, Germany

Filed Nov. 30, 1976, Ser. No. 746,155
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1975, 2553953
Int. Cl.² F23D *13/12*
U.S. Cl. 431—347 **39 Claims**



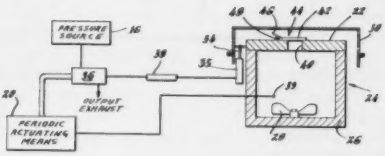
1. A burner for liquid fuels, of the type which is driven with an approximately stoichiometric quantity of air, having an air feed pipe, a fuel feed pipe with a spray nozzle disposed concentrically in the air feed pipe, and a mixture-distributor body arranged at a distance from the spray nozzle, wherein the improvement comprises switchover means associated with the air feed pipe for causing, in one position thereof, the combustion air to be in turbulence in the region of the spray nozzle during start-up, during which there is a yellow flame, and, for allowing, in another position thereof, the combustion air to flow without turbulence during continuous operation after the mixture-distributor body has been heated, during which there is a blue flame.

4,111,643

VENT CONTROL FOR A THERMAL SYSTEM

John M. Welland, Westport, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 25, 1977, Ser. No. 772,160
Int. Cl.² 432 *36;* F27D *19/00;* F26B *21/06*
U.S. Cl. 432—48 **9 Claims**



1. Apparatus for controlling a cooling vent in a thermal system wherein heat is otherwise supplied to control the temperature thereof at a set point, said apparatus comprising:
pressure actuated means for operating the cooling vent;
a source of pressure;
means for controlling output from said pressure source; and
means for periodically actuating said pressure control means to pressurize and depressurize said vent operating means in attaining the minimum average vent opening necessary to maintain temperature control of the thermal system at the set point;
and wherein the thermal system is the oven of a gas chromatograph and the cooling vent is the top of the oven which is positionable to admit room ambient air, said operating means being a pneumatic cylinder having a piston that is connected to the oven top and said pressure control means being a solenoid valve that is electrically driven from said periodic actuating means; and
a fan disposed within the oven and the oven top including an opening therethrough aligned with the low pressure region of said fan; and a plate disposed to cover said opening, a means for displacing said plate from over said opening in operable sequence with said pneumatic cylinder, said pneumatic cylinder lifting the oven top to a predetermined position during this operation with air being exchanged between the oven and room ambient through a common opening, after which said plate displacement means becomes operable together with said pneumatic cylinder and air then being taken in through the opening in the oven top and exhausted through the opening between the oven and the oven top.

4,111,644

ROTARY HEARTH FURNACE WITH PREHEAT CONVEYOR

Robert E. Buckholdt, Abington, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Apr. 19, 1977, Ser. No. 788,832
Int. Cl.[2] F27B 9/16
U.S. Cl. 432—179 11 Claims

1. A rotary hearth furnace for heating work pieces comprising:

(a) means forming a rotatable hearth having a roof thereon;

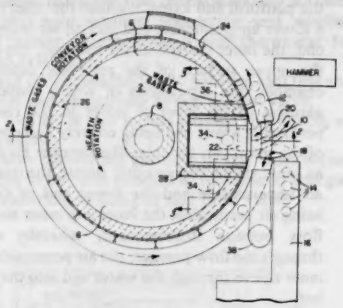
(b) combustion means within said furnace and emitting hot gases therein;

(c) a substantially enclosed preheat conveyor disposed about the outside periphery of said hearth and provided with means to move said work pieces about said periphery;

(d) passage means providing gas communication from said furnace to said preheat conveyor;

(e) means forming a loading and unloading station for the preheat conveyor and for the furnace; and

(f) flow diverting means within said furnace for diverting the flow of combustion gases from said heating means through said passage means (d) and into said preheat conveyor, said passage means being located to provide a combustion gas current that is counter to the hearth travel



direction and also counter to the travel direction of said work pieces on said preheat conveyor.

4,111,645

FINE PARTICLE APPLICATION OF DYES OR OPTICAL BRIGHTENER TO LEATHERS OR FABRICS IN A TUMBLING DRUM AT LOW VOLUMES IN A HYDROPHOBIC SOLVENT

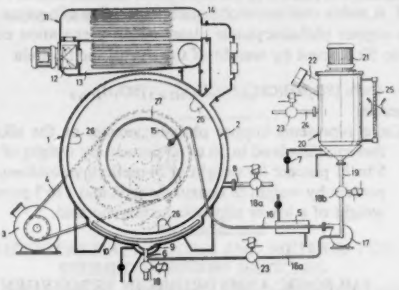
Jacques Zurbuchen, Pratteln; Willi Leutenegger, Bottmingen, both of Switzerland, and Luigi Calcaterra, Milan, Italy, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 325,437, Jan. 22, 1973, abandoned. This application Nov. 24, 1975, Ser. No. 634,740

Claims priority, application Switzerland, Jan. 21, 1972, 000912/72

Int. Cl.[2] D06P *1/90;* D06L *3/12*

U.S. Cl. 8—1 W **20 Claims**



1. A process for dyeing an organic material selected from the group consisting of textile articles, films, natural leather and synthetic leather, from a hydrophobic organic solvent boiling above 80° C, with application of a short goods-to-liquor ratio, which comprises

(a) applying a concentrated liquor of at least one organic dye selected from the group consisting of water-soluble anionic dyestuffs, water-soluble cationic dyestuffs, water-dispersible dyestuffs and water-dispersible optical brighteners heated to at least 80° C with a goods-to-liquor ratio of 1:1.5 to 1:4 in atomized form to the organic material which is being tumbled in an essentially closed chamber, the organic dye being dissolved or finely dispersed in the organic solvent and having affinity to the organic material to be dyed,

(b) heating the thus treated organic material after application of the whole amount of the dye liquor to a temperature of 100° to 150° C,

(c) finishing the dyeing by maintaining the thus heated organic material at said temperature in a vapor atmosphere of the organic solvent until complete fixation of the dyestuff is obtained, and

(d) drying the thus dyed organic material, the entire process being carried out in a batch-wise manner.

4,111,646

METHOD OF NO-CONTACT PRINTING OF CARPET WITH A TRANSFER SHEET

Mervin R. Buckwalter; Walter T. Bulson, both of Lancaster; Larry W. Leininger, Akron; Thomas Posipanko, and Leonard N. Ray, Jr., both of Lancaster, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jan. 24, 1977, Ser. No. 761,604

Int. Cl.[2] D06P *5/20*

U.S. Cl. 8—2.5 A **10 Claims**

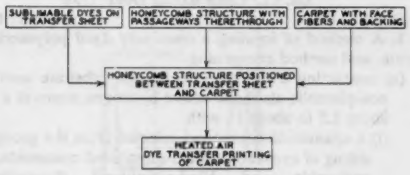
1. A method of dye-transfer printing carpet using sublimable dyes comprising the steps of:

(a) printing an ink containing sublimable dyes onto a porous carrier;

(b) preparing a carpet having fibers and a backing;

(c) arranging said carrier and said carpet in a spaced apart relationship with the inked surface of said carrier facing said carpet;

(d) positioning fluid flow means comprising a plurality of juxtaposed adjoining elongated cylindrical passageways of polygonal cross section for producing and maintaining laminar flow between said carrier and said carpet wherein the equivalent diameter of said passageways is in the range of from about 1/32 inch to about ¾ inch;


SUBLIMABLE DYES ON TRANSFER SHEET
HONEYCOMB STRUCTURE WITH PASSAGEWAYS THERETHROUGH
CARPET WITH FACE FIBERS AND BACKING
HONEYCOMB STRUCTURE POSITIONED BETWEEN TRANSFER SHEET AND CARPET
HEATED AIR DYE TRANSFER PRINTING OF CARPET

(e) applying a heated gaseous medium to said carrier by passing said medium through said carrier to sublime the dyes in the ink and to transfer the sublimed dyes from the carrier, through said fluid flow means, to the carpet so that the fibers of the carpet are dyed; and

(f) separating the printed carpet from said carrier and said fluid flow means.

4,111,647

METHOD FOR MAKING FIRE RETARDANT ZIPPER

Robert Schleifstein, Freehold Township, Monmouth County, N.J., assignor to Coats & Clark, Inc., Stamford, Conn.

Filed Aug. 1, 1977, Ser. No. 820,564

Int. Cl.[2] C09K *3/28;* D06P *5/00*

U.S. Cl. 8—4 **13 Claims**

1. A method of making a fire retardant coil zipper comprising the steps of:

(A) preparing a bath of an aqueous dispersion or emulsion consisting essentially of a sufficient amount of a fire retardant material and a dye carrier to substantially completely impregnate said coil zipper while said bath becomes substantially completely exhausted of said material;

(B) immersing said coil zipper in said bath in a closed vessel;

(C) adjusting the pH of said bath to from about 5.0 to about 5.5;

(D) heating said bath to a temperature of about 220° to about 300° F;

(E) circulating said bath through said coil zipper while maintaining the temperature of said bath at said temperature for at least about 15 minutes whereby said fire retardant material substantially completely impregnates said coil zipper while said bath becomes substantially completely exhausted of said material;

(F) cooling said bath to below about 212° F; and

(G) removing said coil zipper.

13. A method as claimed in claim **1**, wherein said bath further includes a dye, water repellant, mildewcide, softener, lubricant, or mixtures thereof.

4,111,648
REACTIVE DYEING SYSTEMS USING DYES WITH CARBOXYLIC ACID GROUPS

Bobby Lee McConnell, Greensboro, N.C.; Raymond Thornton, Lake Placid, N.Y., and Louis Atkins Graham, Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 588,840, Jun. 20, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,738

Int. Cl.[2] C09B *65/00;* **D06P** *1/36*

U.S. Cl. 8—30 **17 Claims**

1. A method of forming a reactively dyed polymeric substrate, said method comprising

(a) contacting a polymeric cellulosic substrate containing non-phenolic alcoholic active hydrogen atoms at a pH of about 1.5 to about 11 with

(i) a cyanamide compound selected from the group consisting of cyanamide, alkyl-substituted cyanamide, dicyandiamide and alkyl-substituted dicyandiamide, wherein said alkyl groups each contain from 1 to 6 carbon atoms, and with

(ii) a coloring amount of an aromatic dye of the formula Dye-COOH, wherein Dye is an aromatic chromophore wherein the ratio of equivalents of said cyanamide compound to each carboxylic acid function of said aromatic dye is at least about 2:1, and

(b) heating the contacted substrate to a temperature of at least 200° F. for a time sufficient to fix said chromophore to said substrate by condensation reaction between said active hydrogen and the —COOH group of said dye so as to join the chromophore to the substrate through the C atom of said —COOH group.

4,111,649
DYESTUFF PREPARATIONS AND PROCESSES FOR THEIR PRODUCTION

Frank Ward, deceased, late of Gorton, England by Robina Rutherford Flucker Ward, legal representative; John David Hildreth, Henbury Nr. Macclesfield, and Herbert Alexander Potts, Stockport, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 23, 1975, Ser. No. 643,956

Claims priority, application United Kingdom, Dec. 23, 1974, 55530/74

Int. Cl.[2] C09B *27/00*

U.S. Cl. 8—41 R **10 Claims**

1. A process for the manufacture of stable, concentrated solutions of water-soluble tertiary ammonium salts of diazo dyestuffs, which comprises:

(1) diazotising a mixture selected from the group

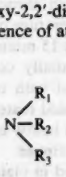
(a) 1 mole each of 2-naphthylamine-6-sulphonic acid and 1-amino-2-methoxy-benzene-5-sulphonic acid;

(b) 1 mole each of 1-amino-2-methyl-benzene-5-sulphonic acid and aniline; and

(c) 1 mole each of naphthionic acid and 1-amino-2-methoxy-benzene-5-sulphonic acid

in the presence of sulfuric acid and reacting the diazo mixture in the same vessel with 1 mole of 5,5'-dihydroxy-7,7'-disulpho-2,2'-dinaphthyl urea, or

(2) diazotising 1 mole each of 1-amino-2-methyl-benzene-5-sulphonic acid and aniline in the presence of sulfuric acid and reacting the diazo mixture in the same vessel with 1 mole of 5,5'-dihydroxy-2,2'-dinaphthyl-amine-7,7'-disulphonic acid in the presence of at least 2 moles of a tertiary amine of the formula



wherein each of R_1, R_2 and R_3 independently represents methyl, ethyl, methoxyethyl or hydroxyethyl, or wherein R_2 and R_3 together with the nitrogen atom form a pyrrolidine, piperidine, morpholine or thiomorpholine ring.

4,111,650
STABLE CONCENTRATED LIQUID PREPARATION OF A PAPER DYE OF THE COPPER PHTHALOCYANINE CLASS

Roger Lacroix, Huningue, France, and Roland Haberli, Wureniingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,450

Claims priority, application Switzerland, Jul. 3, 1975, 8674/75

Int. Cl.[2] D06P *1/384, 1/14;* **C09B** *47/04;* **D21H** *3/80*

U.S. Cl. 8—85 R **4 Claims**

1. A stable concentrated liquid preparation of a paper dye of the copper phthalocyanine class, which preparation contains 15 to 50 percent by weight of the dye of the formula

$$CuPc\ [SO_2NH(CH_2)_3N(CH_3)_2]_{2\ to\ 3}\ [SO_3H]_{1\ to\ 2}$$

wherein

CuPc represents copper phthalocyanine, or the alkali salt thereof, dissolved in 30 to 65 percent by weight of water, 5 to 15 percent by weight of N-methylpyrrolidone, 1 to 7 percent by weight of benzyl alcohol, and 1 to 5 percent by weight of a lower aliphatic carboxylic acid.

4,111,651
SULFONIC ANHYDRIDES IN PEROXYGEN BLEACHING

John H. Blumbergs, Highland Park; Joseph H. Finley, Metuchen, and Burton M. Baum, Princeton, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 3, 1977, Ser. No. 838,851

Int. Cl.[2] D06I *3/02, 3/04*

U.S. Cl. 8—111 **7 Claims**

1. A process for the low temperature bleaching of stained and/or soiled fabrics which comprises treating them with an aqueous peroxygen bleaching solution having a pH of about 6 to about 12 and containing as a peroxygen activator therefor, an effective amount of a sulfonic anhydride having the formula:

$$R_1SO_2OSO_2R_2$$

wherein each of R_1 and R_2 is selected from the class consisting of an alkyl radical of 1 to 18 carbon atoms; a cycloalkyl radical of 3 to 7 carbon atoms; a phenyl radical; a naphthyl radical and a heterocyclic radical having 1 ring or 2 fused rings, said ring or rings containing 5 to 6 members of which 1 to 2 are heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, it being understood that R_1 and R_2 can be identical or different except where they are phenyl or naphthyl in which case R_1 and R_2 are always different.

4,111,652
SYNERGISTIC FLAME RETARDANT MIXTURES AND PRODUCTS

Giuliana C. Tesoro, Dobbs Ferry, N.Y., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 29, 1977, Ser. No. 782,430

Int. Cl.[2] D06M *1/22, 13/20, 13/26;* **C09K** *3/28*

U.S. Cl. 8—116 P **8 Claims**

1. Synergistic mixtures of the reactive flame retardants methyl phosphonic diamide and chloromethyl phosphonic diamide.

3. A process for rendering a cellulose-containing textile substrate flame retardant, said process comprising contacting a liquid comprising a mixture of claim 1 with said substrate, subsequently drying the treated substrate, and subsequently curing the dried substrate, thereby bonding flame retardant moieties to said substrate.

4,111,653
ALKALI STANNITE DEPILATORIES

Martin K. O. Lindemann, Freehold, N.J., and Harvey A. Lazar, Silver Springs, Md., assignors to The Gillette Company, Boston, Mass.

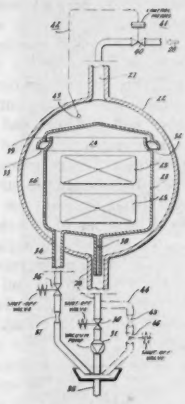
Filed Feb. 16, 1977, Ser. No. 769,386
Int. Cl.[2] A61K *7/155*
U.S. Cl. 8—161 8 Claims

1. An aqueous soluble stannite personal care depilatory composition comprising from 0.2 to 0.8 M Sn^{2+} complexed with a member of the group consisting of polyhydroxymonocarboxylate anions of five to seven carbon atoms and of four to six hydroxyl groups, the molar ratio in said composition of Sn^{2+} to said member being from 2:1 to 1:2 and the pH of said composition being from 12.8 to 13.3.

4,111,654
AUTOCLAVE APPARATUS AND METHOD FOR STERILIZATION OF ARTICLES

Hans Anders Fahlvik, Slöinge, and Nils Arne Fahlvik, Getinge, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Mar. 17, 1977, Ser. No. 778,385
Claims priority, application Sweden, Mar. 19, 1976, 7603436
Int. Cl.[2] A61L *3/00, 3/02*
U.S. Cl. 422—26 7 Claims

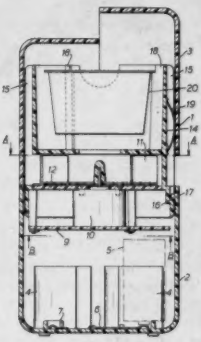


1. A method of sterilizing articles in an autoclave operating with steam and having a pressure vessel type outer wall and a non-pressure type inner wall, said inner wall defining a chamber for receiving the articles to be sterilized, an outer space between said outer wall and said inner wall, a steam supply conduit to said outer space and an open connection between said outer space and said chamber, said connection consisting of a series of holes provided in said inner wall, said method comprising: passing steam through said connection at approximately the thermodynamic optimum velocity, maintaining a constant pressure difference of 0.01–0.02 atmospheres between said outer space and said chamber when steam is supplied to said autoclave by means of the arrangement and construction of said connection between said outer space and chamber, and discharging a given quantity of steam from said chamber through a conduit provided with a throttle therein.

4,111,655
ELECTRICALLY OPERATED AIR FRESHENERS

Edwin Albert Quincey, Seaford, England, assignor to Plessey Handel und Investments AG., Zug, Switzerland

Filed Feb. 25, 1977, Ser. No. 772,133
Claims priority, application United Kingdom, Feb. 28, 1976, 7973/76
Int. Cl.[2] A61L *9/01, 9/04*
U.S. Cl. 422—124 6 Claims



1. An air freshener device comprising a housing having first and second cooperating housing portions movable relative to each other between a first position, wherein said housing portions define a closed chamber, and a second position, wherein at least one flow path is defined from the interior of said housing to the exterior of said housing, an electric motor mounted within said housing, a fan mouned within said housing and connected to said electric motor and operated thereby, an open container for volatile deodorant material mounted within said housing, said container adapted to remain open independent of the relative position of said first and second cooperating housing portions, timing means mounted within said housing for cyclic operation of said electric motor, and switch means mounted within said housing and interconnected with said timing means for providing cyclic operation of said fan when said first and second housing portions are in said second position, and for preventing cyclic operation of said fan when said first and second housing portions are in said first position.

4,111,656
RADIOIMMUNOASSAY METHODS FOR THE DETERMINATION OF L-TRIIODOTHYRONINE AND THYROXINE

Salvatore S. Margherita, Manchester, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 590,671, Jun. 26, 1975, which is a continuation-in-part of Ser. No. 464,345, Apr. 26, 1974, abandoned. This application May 21, 1976, Ser. No. 688,634
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230.6 5 Claims

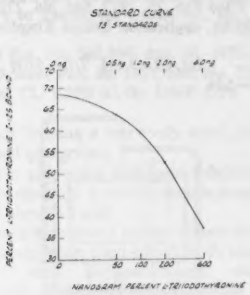
1. A radioimmunoassay method for the in vitro determination of thyroxine in unextracted blood serum which comprises the steps of

mixing a sample of blood serum whose thyroxine content is to be determined with a reagent consisting essentially of a buffered solution containing radioactive thyroxine and an inhibitor for inhibiting binding of thyroxine to thyroxine-binding globulin;

adding to the mixture an antiserum containing antibody capable of immunoreactivity with thyroxine and prepared from an immunogen comprising a conjugate of the N-acetyl derivative of thyroxine coupled to bovine serum albumin with 1-ethyl-3-(3-dimethylaminopropyl)-carbodiimide;

incubating the resultant mixture at a temperature and for a

sufficient period of time to produce substantial equilibration of the antibody bound thyroxine and unbound thyroxine;



separating the unbound thyroxine from the antibody bound thyroxine; and

determining the relative amounts of antibody bound radioactive thyroxine and unbound radioactive thyroxine.

4,111,657

CREATININE ASSAY AND REAGENT SYSTEM

Jerry W. Denney, Carmel, Ind., and Robert L. Long, Spartanburg, S.C., assignors to American Monitor Corporation, Indianapolis, Ind.

Filed Jan. 21, 1977, Ser. No. 761,239
Int. Cl.² C09K *3/00*; G01N *21/02, 33/16*
U.S. Cl. 23—230 B **6 Claims**

1. In a colorimetric or spectrophotometric assay for the quantitation of creatinine in biological fluids,

in which a sample of the biological fluid, containing creatinine, is added to an alkaline picrate solution, the change in or the rate of change in optical density of the mixture being measured at a wavelength of between about 480 and 530 nm, and the creatinine content being then calculated by a comparison to the observed change or rate of change in optical density of a solution with a known concentration of creatinine;

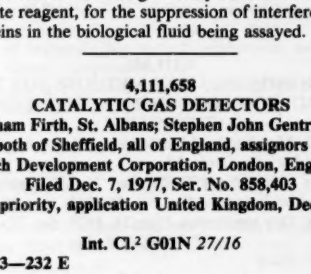
the improvement of adding dimethylsulfoxide to the alkaline picrate reagent, for the suppression of interference due to proteins in the biological fluid being assayed.

4,111,658

CATALYTIC GAS DETECTORS

Jack Graham Firth, St. Albans; Stephen John Gentry, and Alan Jones, both of Sheffield, all of England, assignors to National Research Development Corporation, London, England

Filed Dec. 7, 1977, Ser. No. 858,403
Claims priority, application United Kingdom, Dec. 13, 1976, 51935/76
Int. Cl.² G01N *27/16*
U.S. Cl. 23—232 E **10 Claims**



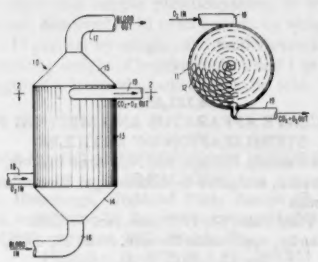
10. A method of detecting a combustible gas having an exothermic oxidation reaction comprising exposing to an atmosphere to be tested a catalytic element in the form of a body of material a major proportion of which consists of an aluminosilicate zeolite having a ratio of silicon to aluminium of greater than 2 and a three dimensional pore structure, there being a catalyst metal within the zeolite pores; maintaining the catalyst at a temperature at which it causes combustion of said combustible gas in an oxygen-containing atmosphere; and sensing any thermal effect on the catalyst caused by the occurrence thereon of the combustion reaction.

4,111,659

MASS AND HEAT TRANSFER EXCHANGE APPARATUS

Wallace W. Bowley, Stafford Springs, Conn., assignor to Graeme L. Hammond, Hamden, Conn.

Continuation-in-part of Ser. No. 509,082, Sep. 25, 1974, abandoned. This application Dec. 27, 1976, Ser. No. 755,089
Int. Cl.² A61M *1/03*
U.S. Cl. 422—48 **9 Claims**



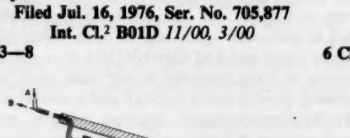
1. A blood oxygenator comprising a housing having a cylindrically shaped interior and having ends with a blood inlet means and a blood outlet means connected to said ends, a spirally wound membrane means within said housing, said membrane means including an oxygen-containing gas inlet means for said membrane means, a gas outlet means for said membrane means, both said gas inlet and gas outlet means being located external to said housing and a spirally wound membrane structure for mass transfer between an oxygen-containing gas within the first membrane structure and blood within said housing and being formed from at least two membrane sheets wherein at least one of said sheets comprises an embossed semipermeable film having a plurality of spaced-apart projections connected with passageways, said embossed film being permeable to carbon dioxide and oxygen and being sealed to a second membrane to define a fluid path from said membrane inlet means to said outlet means through said projections and passageways.

4,111,660

LIQUID-LIQUID EXTRACTION METHOD AND APPARATUS

Yozo Kabasawa, 1-2-13, Minami-cho, Kokubunji-shi, and Takenori Tanimura, 1-8-11, Matsunoki, Suginami-ku, Tokyo, both of Japan

Filed Jul. 16, 1976, Ser. No. 705,877
Int. Cl.² B01D *11/00, 3/00*
U.S. Cl. 423—8 **6 Claims**



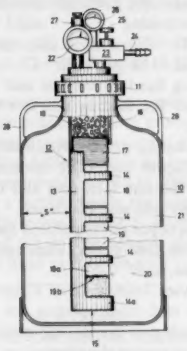
1. A liquid-liquid extraction apparatus comprising an elon-

gated extraction column arranged at an angle to the horizontal, said column being divided by partitions into a plurality of intercommunicating compartments, an inlet and outlet at each end of said column, means for introducing a less dense liquid into the lower inlet of said column for discharge through said upper outlet and means for introducing a more dense liquid into said upper inlet for discharge through said lower outlet, said liquids being immiscible with one of them having dissolved therein the solute to be extracted by the other, and means for imparting bodily rotation to said column about an axis parallel and eccentric to said inclined column axis, said inlet and outlet at the same column end being arranged concentrically and including extensions which are eccentric to said column end and coaxial with said axis of rotation.

4,111,661
OXYGEN GENERATOR WITH CARTRIDGE HOLDER FOR OXYGEN-YIELDING CARTRIDGES

Günther Rothenberger, Bad Homburg von der Hohe, Fed. Rep. of Germany, assignor to Rothenberger GmbH Werkzeuge und Maschinen KG, Frankfurter, Fed. Rep. of Germany

Continuation of Ser. No. 643,582, Dec. 22, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,612
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1974, 2461681
Int. Cl.[2] B01J *7/00*; C01B *13/00*
U.S. Cl. 422—117 **5 Claims**



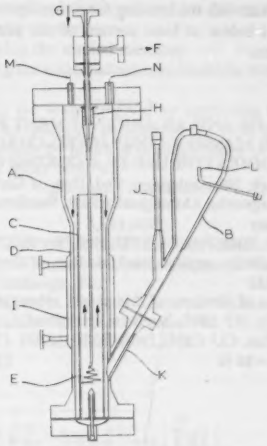
1. Oxygen generator for heating, welding, cutting and brazing work comprising a gas-tight container and removable cartridge-holder means for the insertion of combustible cartridges yielding oxygen in the burning state, said gas tight container being constructed as a pressure tank and enveloping the cartridge-holder means to leave a storage volume in said tank sufficient to store the collection of oxygen liberated by one or more of said cartridges inserted in the cartridge-holder means, said oxygen generator having a pressure type fastening means connected to the neck of the upper end of said container, the upper end of said cartridge-holder means consisting of a cylindrical tube inserted through and joined to said neck via said pressure type fastening means in a gas tight manner.

4,111,662
ARRANGEMENT FOR PREPARING ALKYLALUMINUMS

Robert Masotti, Lyon; Georges Biola, Venissieux, and Henri Guerpillon, Saint-Cyr Au Mont d'Or, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jun. 24, 1976, Ser. No. 699,338
Claims priority, application France, Jun. 27, 1975, 75 20254
Int. Cl.[2] C07F *5/06*; B01J *8/22*
U.S. Cl. 422—231 **7 Claims**

1. Apparatus for preparing alkylaluminums comprising a single stage reactor formed of an outer tubular member and an inner tubular member concentrically arranged within the outer tubular member with an annular space in between, the outer tubular member having a portion of increasing diameter in the area above the inner tubular member, a gas diffuser in communication with the bottom portion of the inner tubular member and means for introducing a gas through the diffuser into the interior of the inner tubular member whereby liquid filling the inner tubular member is put into circulation by the gas-lift methods, inlets for feeding hydrogen, aluminum particles and

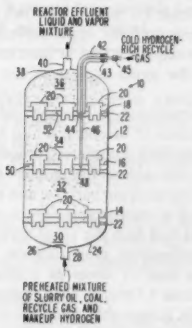


olefins having 2 to 30 carbon atoms into the upper portion of the reactor, an outlet in communication with the upper portion of the reactor for the removal of gases, a decanter having a quiescent zone for decanting solid particles, a passage extending at an angle greater than 45° with the horizontal communicating the decanter with the annular space in the bottom portion of the reactor for the flow of liquid therebetween, and an overflow in the decanter, at a level above the upper end of the inner tubular member which operates to control the level of liquid in the decanter and reactor.

4,111,663
REACTOR FOR SOLVENT REFINED COAL

Ronald H. Wolk, and Norman C. Stewart, both of San Jose, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 3, 1977, Ser. No. 803,097
Int. Cl.[2] B01F *3/04*; B01J *1/00*; C10G *1/04*
U.S. Cl. 422—191 **6 Claims**


REACTOR EFFLUENT LIQUID AND VAPOR MIXTURE
COLD HYDROGEN-RICH RECYCLE GAS
PREHEATED MIXTURE OF SLURRY OIL, COAL, RECYCLE GAS AND MAKEUP HYDROGEN

1. A reactor for solvent refining of coal comprising: a reactor housing having a sidewall, a top and a bottom, said bottom

having an inlet port for allowing a mixture of a solvent, coal, recycle gas and makeup hydrogen to be directed into the housing; at least a pair of vertically spaced, generally horizontal perforated plates disposed within the housing to divide the interior of the housing into respective compartments, each plate having a bubble cap in each perforation thereof, respectively, the bubble caps of each plate having means causing the formation of a vapor zone beneath the plate and permitting upflow of a mixture of liquid and gas from each compartment and its vapor zone to the next compartment thereabove; and means coupled with the housing for directing a coolant into the vapor zones below at least certain of the plates to cool the vapor therein.

4,111,664

METHOD OF AND AN ARRANGEMENT FOR MAKING STABLE MASSIVE COMPACTED COAL CHARGE BODIES FOR USE IN A COKING OVEN

Kurt Leibrock, Fürstenhausen, Fed. Rep. of Germany, assignor to Saarbergwerke Aktiengesellschaft, Saarbrucken, Fed. Rep. of Germany

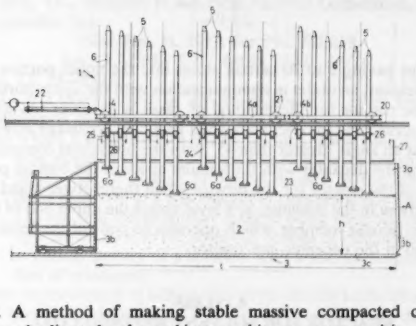
Filed Jun. 28, 1977, Ser. No. 810,798

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1976, 2629122

The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.

Int. Cl.[2] C10L *5/00;* B30B *11/00, 15/14*

U.S. Cl. 44—10 G **42 Claims**



1. A method of making stable massive compacted coal charge bodies to be charged into a coking oven, comprising the steps of supplying coal particles into a confining space to form therein a particulate bed having an upper surface; and subjecting the particulate bed to compacting forces requisite for converting the particulate bed into a respective charge body of a substantially parallelepiped configuration the height of which amounts to at least 11 times its width and having a specific density of at least 1.1 metric tons/m^3, including contacting a plurality of rams with the upper surface of the particulate bed in such a time sequence that at least one of the rams is out of contact with the upper surface of the particulate bed at any instant.

17. An arrangement for making stable massive compacted coal charge bodies to be charged into a coking oven, comprising a mold bounding a confining space; means for introducing coal particles into said confining space to form therein a particulate bed having an upper surface; and means for subjecting the particulate bed to compacting forces requisite for converting the particulate bed into the respective charge body of a substantially parallepiped configuration the height of which amounts to at least 11 times its width and having a specific density of at least 1.1 metric tons, including a plurality of rams each of which is movable into and out of contact with the upper surface of the particulate bed, and means for so moving said rams in a time sequence that at least one of said rams is out of contact with the upper surface of the particulate bed at any instant.

4,111,665

APPARATUS FOR THE GASIFICATION UNDER PRESSURE OF BITUMINOUS COAL, ESPECIALLY OF FINE COAL IN A GENERATOR

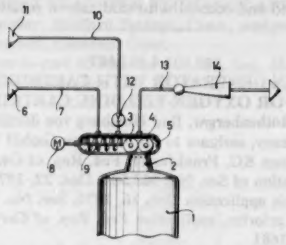
Rudolf Pasternak, Gladbeck, and Jochen Bauer, Essen, both of Fed. Rep. of Germany, assignors to Steag A.G., Essen, Fed. Rep. of Germany

Filed Sep. 7, 1976, Ser. No. 720,985

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1975, 2540166

Int. Cl.[2] C10J *3/50*

U.S. Cl. 48—77 **2 Claims**



1. An apparatus for the gasification of fine bituminous coal under pressure comprising

a. a container provided with an inlet opening for receiving briquetted coal to be gasified,

b. a closed casing fixed directly on said inlet opening,

c. feeding means for feeding the fine feed coal into said closed casing,

d. a briquette forming device within said closed casing immediately adjacent said inlet opening for forming briquettes from the fine feed coal and discharging the briquettes directly into said container,

e. a pressure conveyor device within said closed casing for forcing the fine feed coal continuously to said briquette forming device, and

f. a suction device leading from a portion of said casing remote from said inlet opening for removing any gas which may leak past the feeding means and the briquette forming device into said casing.

4,111,666

METHOD OF MAKING CLEANING, SCOURING AND/OR POLISHING PADS AND THE IMPROVED PAD PRODUCED THEREBY

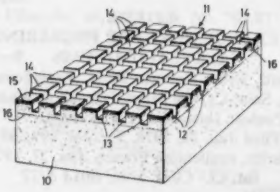
Heinz Kalbow, Konigswinter-Stieldorf, Fed. Rep. of Germany, assignor to Collo GmbH, Bornheim-Hersel, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 662,349, Mar. 1, 1976, Pat. No. 4,055,029. This application Jul. 6, 1976, Ser. No. 702,391

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1975, 7507155[U]; Feb. 12, 1976, 2605444

Int. Cl.[2] B24D *3/32, 15/04*

U.S. Cl. 51—295 **8 Claims**



1. A method of increasing the tear resistance of a foam

plastic scouring, cleaning or polishing pad in the vicinity of a plurality of separate, closely adjacent foam plastic protuberances formed integrally with the body of the pad and defined by grooves in said pad, said pad being formed from a pliable, flexible open celled foamed plastic material with a low tear strength and said protuberances together forming an upper scrubbing surface and having a lower root portion terminating at a main portion of said body, said method comprising the steps of:

(a) providing a polyurethane liquid adhesive impregnating agent which will cure into a substantially elastic flexible mass and increase the tear strength of said foamed plastic material;

(b) impregnating said foam plastic protuberances, and part of said main body portion beyond said root portions, with amounts of said impregnating agent, so that said protuberances and said part of said main body portion will still be absorptive; and

(c) causing said agent to cure whereby said protuberances and said part of said main body portion still are absorptive and are substantially more resistant to tearing than said initial foam plastic material.

4,111,667

WOVEN POLYESTER BACKED FLEXIBLE COATED ABRASIVE HAVING MICROBALLOONS IN BACKSIZE

David G. Adams, Ballston Spa, N.Y., assignor to Norton Company, Worcester, Mass.

Filed Apr. 15, 1977, Ser. No. 787,909
Int. Cl.[2] B24D *3/34, 11/02*
U.S. Cl. 51—295 **4 Claims**

1. A coated abrasive product comprising a fabric backing member for a flexible coated abrasive product of woven polyester yarns and having a backsize coating of phenolic resin composition including hollow micro-spheres of synthetic resins or glass in the amount of from 10 to 50% by volume of the coating and having a particle size in the range of from 5 to 125 microns whereby the coated fabric is stiffer than such fabric without inclusion of the hollow spheres and having abrasive grits bonded to the front surface thereof.

4,111,668

FUSED ALUMINUM OXIDE ABRASIVE GRAIN CONTAINING REDUCED TITANIUM OXIDE

Thomas Bruce Walker, Lewiston; Robert J. Seider, Ransomville, and Paul Cichy, Buffalo, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,817
Int. Cl.[2] C09K *3/14*
U.S. Cl. 51—309 A **17 Claims**

1. A process for producing a fused abrasive grain which is bluish black in color and consists essentially of:

(1) titanium oxide containing from about 0.42 to about 0.84% titanium, by weight of the abrasive grain, said titanium being present as a reduced titanium oxide having an average oxidation state lower than in Ti_2O_3;

(2) from about 0.05 to about 0.3% by weight carbon;

(3) from about 0.02 to about 0.1% by weight Na_2O;

(4) from 0 to about 0.1% by weight total of calcium and silicon oxides; and

(5) alumina;

said abrasive having a gain on ignition in air before roasting at 1300° C, when of a size of about 147 microns and finer, of from about 0.4 to about 0.7% by weight; comprising the steps of:

(a) charging to an electric furnace a mixture of:

(i) from about 0.7 to about 1.7 parts by weight high purity TiO_2;

(ii) from about 98.6 to about 99.3 parts by weight alumina containing Na_2O as the only oxide impurity present in an amount in excess of 0.1% by weight; and

(iii) carbon, in an amount of from 1 to 10 times the theoretical amount necessary, based on the amount of TiO_2 and Na_2O added, to reduce the TiO_2 and Na_2O according to the following formulas:

(A) $2TiO_2 + C = Ti_2O_3 + CO$, and

(B) $Na_2O + C = 2Na + CO$ and

(b) subjecting the mixture of titania, alumina and carbon to the heat of an electric arc, said electric arc being a reducing arc passed from carbon electrodes to the mixture of titania, alumina and carbon, for a time sufficient to melt the mixture;

(c) solidifying the melted mixture;

(d) crushing the solidified mixture to obtain abrasive grain; and

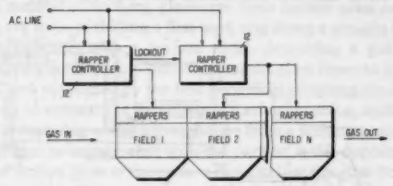
(e) roasting the abrasive grain by subjecting the crushed grain to an oxidizing atmosphere for from about 5 minutes to about 64 hours at a temperature of from about 1250° to about 1450° C.

4,111,669

MAGNETIC IMPULSE RAPPER CONTROL SYSTEM

John S. League, IV, Baltimore, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 544,768, Jan. 28, 1975, abandoned. This application Apr. 21, 1977, Ser. No. 789,493
Int. Cl.[2] B03C *3/00*
U.S. Cl. 55—112 **23 Claims**



12. A controller for selectively energizing actuating coils of rappers of an electrostatic precipitator assembly to impart motion to a portion of the precipitator assembly and remove accumulated material therefrom, the controller comprising:

a rapper supply bus common to a plurality of the actuating coils of the rappers of the electrostatic precipitator assembly;

means for intermittently supplying a d.c. potential to the rapper supply bus for the time periods each of a predetermined duration; and

means responsive to the d.c. potential of said supplying means for selectively connecting at least one actuating coil of said plurality of actuating coils to said rapper supply bus during each of said time periods to energize such actuating coil with said d.c. potential.

4,111,670

TRUCK MOUNTED SEPARATOR APPARATUS

Thomas M. DeMarco, Chicago, Ill., assignor to NFE International, Ltd., Palatine, Ill.

Filed Mar. 16, 1977, Ser. No. 778,071
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—315 **16 Claims**

1. Mobile apparatus for separating materials including heavy particulate matter from an input airstream and for collecting said materials for delivery to a discharge point, said apparatus comprising:

a vehicle having a frame;

a platform supportably positioned on said vehicle frame and having one end pivotably coupled to said frame;

a first enclosed collection chamber mounted on said platform, said first chamber having an inlet through which said input airstream enters said first chamber and a first

discharge opening adjacent the pivoted end of said platform;

a second collection chamber mounted on said platform forwardly on said first collection chamber;

vacuum collector means communicating with said second collection chamber in substantial airtight relation therewith;

means including a duct coupling said first collection chamber directly to said vacuum collector means;

said vacuum collector means including means for creating a vacuum to draw said input airstream into said first chamber and through said duct to said vacuum collector means;

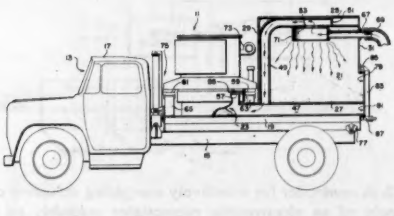
means in said first collection chamber for separating said materials comprising generally said heavy particulate matter from said airstream, said heavy particulate matter being collected in said first collection chamber and the remainder of said materials being carried by said airstream through said duct to said vacuum collector means;

said vacuum collector means separating the remainder of said materials from said airstream and emptying said separated materials into said second collection chamber;

means comprising a passageway communicating with and extending rearwardly from said second collection chamber beneath said first collection chamber, said passageway having a corresponding second discharge opening immediately adjacent to said first discharge opening of said first collection chamber at said pivoted end of said platform;

a movable door;

means mounting said door on said first collection chamber to cover said first and second discharge openings; and



means for tilting said platform to move said door away from said first and second discharge openings to permit said materials collected in said first collection chamber to empty therefrom through said first discharge opening and said materials collected in said second collection chamber to move through said passageway and empty therefrom through said second discharge opening.

10. Mobile apparatus for separating materials including heavy particulate matter from an input airstream and for collecting said materials for delivery to a discharge point, said apparatus comprising:

a vehicle having a frame,

a platform supportably positioned on said vehicle frame and having one end pivotably coupled to said frame;

a first enclosed collection chamber mounted on said platform, said first chamber having an inlet through which said input airstream enters said first chamber and a first discharge opening adjacent the pivoted end of said platform;

a second collection chamber mounted on said platform forwardly of said first collection chamber;

a passageway communicating with and extending rearwardly from said second collection chamber beneath said first collection chamber, said passageway having a corresponding second discharge opening immediately adjacent to said first discharge opening of said first collection chamber at said pivoted end of said platform;

vacuum collector means communicating with said second collection chamber in substantial airtight relation therewith;

a duct coupling said first collection chamber to said passageway;

said vacuum collector means including means for creating a vacuum to draw said input airsteam into said first chamber and through said duct, said passageway and said second chamber to said vacuum collector means;

means in said first collection chamber for separating said material comprising generally said heavy particulate matter from said airstream, said heavy particulate matter being collected in said first collection chamber and the remainder of said materials being carried by said airstream to said vacuum collector means;

said vacuum collector means separating the remainder of said materials from said airstream and emptying said separated materials into said second collection chamber;

a movable door;

means mounting said door on said first collection chamber to cover said first and second discharge openings; and

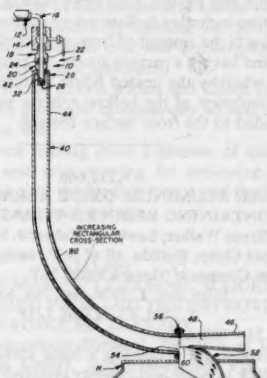
means for tilting said platform to move said door away from said first and second discharge openings to permit said materials collected in said first collection chamber to empty therefrom through said first discharge opening and said materials collected in said second collection chamber to move through said passageway and empty therefrom through said second discharge opening.

4,111,671

METHOD AND APPARATUS FOR CARBON DIOXIDE SNOW SEPARATION

Hilding Victor Williamson, Hanover, Pa., assignor to Chemetron Corporation, Chicago, Ill.

Continuation of Ser. No. 588,550, Jun. 19, 1975, abandoned.
This application Feb. 22, 1977, Ser. No. 770,465
Int. Cl.[2] F25J *1/00*
U.S. Cl. 62—10 **8 Claims**



1. A method of separating carbon dioxide snow from a mixture of carbon dioxide snow and vapor comprising the steps of:

expanding a stream of liquid carbon dioxide to a pressure below the thermodynamic triple point into an inlet end of a continuously increasing rectangular cross-section conduit to form a flowing mixture of carbon dioxide snow and vapor;

conducting said mixture at sub-atmospheric pressure in a curvilinear path defined by said conduit to subject said flowing mixture to a uniform field of centrifugal forces, whereby said snow is concentrated in a stream in the region having the largest centrifugal force; and

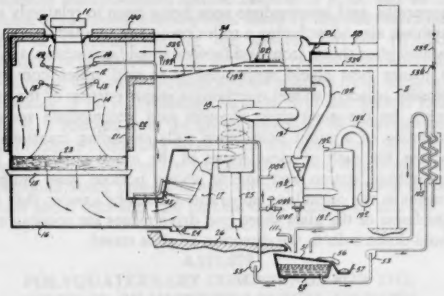
separating said concentrated stream of snow from said vapor by a physical barrier to discharge said concentrated stream of snow from said conduit.

4,111,672

METHOD AND APPARATUS FOR SUPPRESSION OF POLLUTION IN MINERAL FIBER MANUFACTURE

Jean A. Battigelli, Rantigny, and Marie-Pierre Barthe, Clermont, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 655,503, Feb. 5, 1976, abandoned, which is a continuation of Ser. No. 511,500, Oct. 2, 1974, abandoned. This application Dec. 3, 1976, Ser. No. 747,432
Claims priority, application France, Oct. 22, 1976, 76 31860; Oct. 10, 1973, 73 36169
Int. Cl.² C03B 37/04
U.S. Cl. 65—3 C 25 Claims



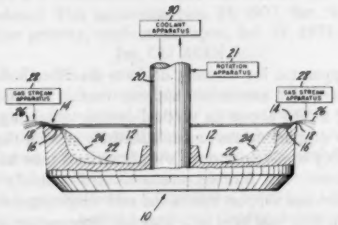
1. A process for manufacture of fibers comprising forming fibers by gas blast attenuation of thermoplastic material, establishing a current of the attenuating gas and the attenuated fibers in a forming section having a foraminous fiber collecting device at a boundry of the forming section through which the gas of said current passes and on which the fibers collect to form a blanket, recirculatng gas through a recirculation path extended from the downstream side of the collection device to the forming section, spraying water on the current of attenuating gas and attenuated fibers in the forming section, separating water and entrained solids from the gases in said recirculation path, bringing the separated water into heat exchange relation with a heat transfer medium, separating entrained solids from the separated water, recirculating the solids freed water to the water spraying of the current in the forming section, characterized by regulating the temperature of the gas in said current in the forming section by regulating the heat transfer between the separated water and said heat transfer medium.

4,111,673

MINERAL FIBERIZING WHEEL

Cletus L. Van Natta, Red Wing, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 696,424, Jun. 15, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 844,117
Int. Cl.² C03D 37/04
U.S. Cl. 65—6 3 Claims



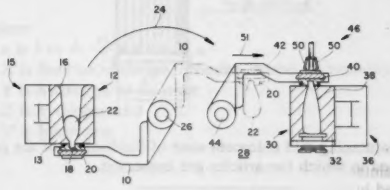
1. In a metal wheel for use in mineral fiberizing processes of the type in which molten mineral is introduced onto the operative surface of the wheel and thereafter tangentially discharged therefrom the improvement comprising said operative surface being nitrided.

4,111,674

GLASSWARE FORMING STRAIGHT LINE METHOD

Anthony T. Zappia, Carmel, Ind., assignor to Ball Packaging Products, Inc., Muncie, Ind.

Division of Ser. No. 718,404, Aug. 30, 1976, Pat. No. 4,058,388. This application Aug. 1, 1977, Ser. No. 820,792
Int. Cl.² C03B 9/14
U.S. Cl. 65—77 8 Claims



1. A method of forming glassware from molten glass comprising the steps of shifting a first neck ring along a straight line into engagement with a parison mold, depositing a gob of molten glass in the parison mold so that the glass flows to form a first blank supported by the first neck ring, inverting the first neck ring to support the first blank at a reheat position, shifting a second neck ring along a straight line from a waiting position to a position in engagement with the parison mold, depositing a gob of molten glass in the parison mold so that the glass flows to form a second blank supported by the second neck ring, shifting the first neck ring along a straight line from the reheat position to a position to present the first blank for engagement by a blow mold, blowing a first bottle in the blow mold, reverting the first neck ring to the waiting position, inverting the second neck ring to the reheat position, shifting the first neck ring along a straight line into a position in engagement with the parison mold and shifting the second neck ring along a straight line from the reheat position to a position to present the second blank for engagement by the blow mold.

4,111,675

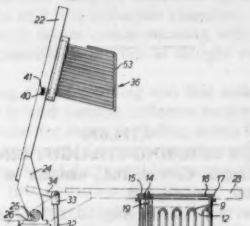
THERMAL TREATMENT OF GLASS IN A FLUIDIZED BED

Geoffrey Martin Ballard, St. Helens, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Jun. 1, 1977, Ser. No. 802,450
Claims priority, application United Kingdom, Jun. 10, 1976, 24125/76
Int. Cl.² C03B 27/00
U.S. Cl. 65—114 15 Claims

3. A method of thermally treating a glass article, comprising immersing the article in a part of a gas-fluidised bed of particulate material which is maintained in a quiescent uniformly expanded state of particulate fluidisation, regulating the temperature of the fluidised bed by heat exchange with the particulate material in a localised region of the fluidised bed away from the part in which the articles are immersed, and, between

immersion of successive articles in the bed, agitating said localised region of the fluidised bed to enhance said heat exchange



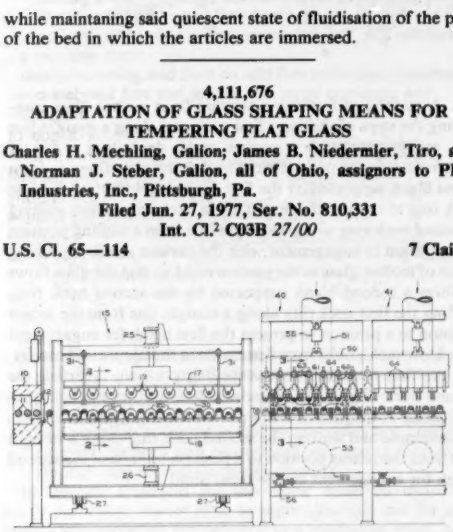
while maintaning said quiescent state of fluidisation of the part of the bed in which the articles are immersed.

4,111,676

ADAPTATION OF GLASS SHAPING MEANS FOR TEMPERING FLAT GLASS

Charles H. Mechling, Galion; James B. Niedermier, Tiro, and Norman J. Steber, Galion, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 27, 1977, Ser. No. 810,331
Int. Cl.[2] C03B *27/00*
U.S. Cl. 65—114 **7 Claims**



1. A method of tempering flat glass sheets wherein each flat glass sheet is conveyed into a heating chamber where the glass sheet is heated to a temperature suitable for tempering; the heated glass sheet is then removed from the heating chamber and conveyed through an elongated zone of essentially still, ambient air on a roller conveyor extending between the heating chamber and a quenching zone, whereby exposure to the ambient air while passing along the roller conveyor causes cooling of the upper surface of the glass sheet greater than the cooling of the bottom surface of the glass sheet such that a sufficient top-to-bottom temperature difference is produced to lead to subsequent warpage of the glass sheet; and then passing the glass sheet into the quenching zone where it is tempered by directing blasts of gaseous quenching medium onto the top and bottom surfaces;

wherein the improvement comprises retarding heat loss from the upper surface of the glass sheet while on said roller conveyor by means of a heat shield suspended above and closely adjacent to the upper surface of each glass sheet during a major portion of its travel along said roller conveyor, and controlling the relative rates at which the tempering medium is directed onto the top and bottom surfaces of each glass sheet in the quenching zone so as to produce a more rapid rate of cooling at the bottom surface than at the top surface, whereby tempered glass sheets substantially free from warpage are produced.

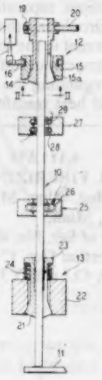
7. An apparatus for tempering flat glass sheets comprising: a glass sheet heating furnace including means for heating a glass sheet to a temperature suitable for tempering, a glass sheet quenching station including means for directing blasts of gaseous tempering medium onto opposite sides of a glass sheet received therein so as to temper the glass sheet, said furnace and said quenching station being spaced apart by an intermediate zone of sufficient length to receive a glass sheet bending apparatus, said intermediate zone being open to relatively still ambient air and including a roller conveyor adapted to convey heated glass sheets from said furnace to said quenching station, a planar heat shield suspended over said roller conveyor closely adjacent to and overlying a major portion of the path taken by the glass sheet through said intermediate zone, a plurality of straight hold-down rolls extending transversely across the path of glass travel in the initial portion of the quenching station and spaced above bottom glass support means in the quenching apparatus a distance greater than the thickness of the glass sheet, and drive means for rotating said hold-down rolls in the direction of glass travel.

4,111,677

APPARATUS FOR DRAWING GLASS TUBING

James D. Andrews, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 24, 1975, Ser. No. 543,754
Int. Cl.[2] C03B *23/00, 21/00, 23/04*
U.S. Cl. 65—271 **6 Claims**



1. An apparatus for forming uniform diameter nozzles on glass tubes which comprises support means for releasably supporting a tube above its vertical center, weighting means below said support means and substantially coaxial therewith for releasably applying a dead weight to said tube below its vertical center, first furnace means located centrally of said tube between said support means and said weighting means and arranged to heat said tube to a drawing temperature and second furnace means located between said first furnace means and said support means for heating a portion of said tube to a temperature at which said tube becomes slightly plastic but substantially below said drawing temperature.

4,111,678

FOLIAR FEEDING ORGANOMETALLIC COMPOSITION

John D. Downer, Trinidad, Trinidad and Tobago, assignor to Texaco Trinidad Inc., Pointe-a-Pierre, Trinidad and Tobago

Filed Mar. 10, 1977, Ser. No. 776,344
Int. Cl.[2] C05F *11/00*
U.S. Cl. 71—27 5 Claims

1. A foliar feeding spray composition for supplying trace metals to plants comprising a non-phytotoxic hydrocarbon mineral oil carrier having a minimum gravity API of 27, a viscosity at 100° F of between 55 and 100 Saybolt Universal Seconds, a boiling range between 600° F and 755° F and a minimum unsulphonated residue content of 85%; and an oil soluble organometallic compound made by thermal rearrangement of a chelate having the general formula $[R_1C(O)CHR_2C(O)OR_3]_2M$, where R_1 and R_3 are radicals containing up to about 10 carbon atoms each and are selected from the group consisting of alkyl, cycloalkyl, aralkyl, aryl and alkaryl radicals, R_2 is selected from the group consisting of hydrogen and alkyl radicals containing up to 10 carbon atoms and M is zinc, copper, iron, manganese or molybedenum; said organometallic compound being present in said oil at a concentration of between about 0.05 and 12.0 percent basis volume of said oil.

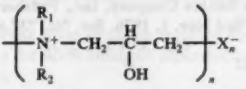
4,111,679

POLYQUATERNARY COMPOUNDS FOR THE CONTROL OF MICROBIOLOGICAL GROWTH

Salem A. Shair, Lake Zurich, Ill.; Stewart N. Paul, Mississauga, and James E. Cairns, Islington, both of Canada, assignors to Chemed Corporation, Cincinnati, Ohio

Filed Aug. 17, 1977, Ser. No. 825,272
Int. Cl.[2] A01N *9/20*
U.S. Cl. 71—67 3 Claims

1. The method for controlling microorganisms in industrial cooling water systems which comprises adding to the system a microbiocidal amount of a polyquaternary amine of the formula



where R_1 and R_2 are methyl or ethyl, X is Cl, Br, or I, and n is 3 to 10,000.

4,111,680

HERBICIDAL COMPOSITIONS CONTAINING 3-ISOXAZOLYLUREA DERIVATIVES

Hisajiro Yukinaga, Kusatsu; Shinzaburo Sumimoto, Osaka; Ichiro Ishizuka, Higashinose, and Jitsuo Sugita, Ikeda, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 667,033, Mar. 15, 1976, Pat. No. 4,062,861, which is a continuation of Ser. No. 491,491, Jul. 23, 1974, abandoned. This application Sep. 23, 1977, Ser. No. 836,238
Claims priority, application Japan, Jul. 27, 1973, 48-85339
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—88 13 Claims

1. A herbicidal composition comprising a herbicidal amount of a compound selected from the group consisting of 1-methyl-3-(5-i-propyl-3-isoxazolyl)urea, 1-methyl-3-(5-t-butyl-3-isoxazolyl)urea, 1,1-dimethyl-3-(5-t-butyl-3-isoxazolyl)urea, 1,3-dimethyl-3-(5-t-butyl-3-isoxazolyl)urea, 1,1,3-trimethyl-3-(5-t-butyl-3-isoxazolyl)urea, 1-methyl-1-butyl-3-(5-t-butyl-3-isoxazolyl)urea, 1-allyl-1-methyl-3-(5-t-butyl-3-isoxazolyl)urea, 1,1-dimethyl-3-(5-i-propyl-3-isoxazolyl)urea, 1-methoxy-1-methyl-3-(5-t-butyl-3-isoxazolyl)urea, 1-butylthio-1-methyl-3-(5-t-butyl-3-isoxazolyl)urea, 1-methyl-1-butyl-3-(5-i-propyl-3-isoxazolyl)urea and 1,3-dimethyl-3-(5-i-propyl-3-isoxazolyl-)urea, in combination with a carrier therefor.

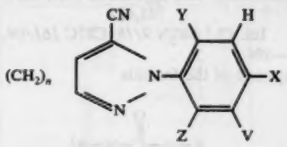
4,111,681

CYCLOALKANAPYRAZOLE-3-CARBONITRILE HERBICIDES

Steven Jerome Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 9, 1976, Ser. No. 720,801
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—92 30 Claims

1. A compound of the formula



where

n is 3 or 4;
X is fluorine, chlorine, bromine, cyano or methoxy;
Y is hydrogen or fluorine;
Z is hydrogen and
V is hydrogen.

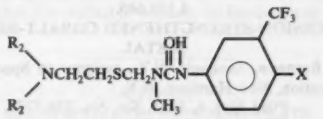
4,111,682

N-(AMINOALKYLENE THIOMETHYL)-N'-(ARYL) UREA HERBICIDES

Arnold David Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

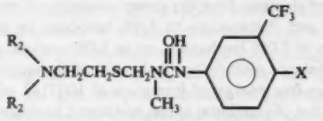
Continuation of Ser. No. 540,374, Jan. 13, 1975, abandoned. This application May 31, 1977, Ser. No. 801,889
Int. Cl.[2] C07C *127/15, 127/19;* A01N *9/12*
U.S. Cl. 71—98 4 Claims

1. A compound having the formula



wherein R_2 is alkyl containing 1 through 4 carbon atoms and X is selected from the group consisting of hydrogen and chlorine.

3. The method of controlling weed species by applying to the habitat of said weed species to be controlled an effective amount of a compound having the formula



wherein R_2 is alkyl containing 1 through 4 carbon atoms and X is selected from the group consisting of hydrogen and chlorine.

4,111,683
N-ALKYL OR ALKOXY-N'-SUBSTITUTED HYDROCARBYL UREA

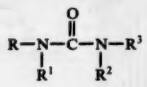
Malcolm Scott Singer, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 591,058, Jun. 27, 1975, abandoned, which is a continuation of Ser. No. 385,521, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 124,422, Mar. 16, 1971, abandoned, and Ser. No. 124,423, Mar. 16, 1971, abandoned. This application Nov. 12, 1976, Ser. No. 741,422

Int. Cl.² A01N *9/18*; C07C *161/04*

U.S. Cl. 71—104 **9 Claims**

1. A compound of the formula



wherein R^3 is $-CH(X)CZ_3$; X is $-N{=}C{=}U'$; U' is sulfur, Z is halogen of atomic number of 9 to 35; R^2 is alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms; R is alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 2 halogens of atomic number 9 to 35, alkyl of 1 to 2 carbon atoms, alkoxy of 1 to 2 carbon atoms or one trifluoromethyl.

4,111,684
HERBICIDE-FILLED CELLULOSE ESTER PARTICLES HAVING CONTROLLED RELEASE PROPERTIES

Norman W. Thomas, Warren; Frank S. Model, Basking Ridge, and Charles L. Smart, Millington, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 28, 1977, Ser. No. 791,823

Int. Cl.² A01N *9/24, 9/20*

U.S. Cl. 71—115 **13 Claims**

1. A controlled-release herbicidal composition comprising discrete particles of a water-leachable benzoic acid herbicide selected from the group consisting of mono-, di- and tri- substituted benzoic acids in which the substituents are halo, amino, nitro and lower alkoxy occupying the voids, or channels, of a particulate, substantially water-impermeable, porous cellulose ester carrier, said voids, or channels, communicating with the exterior surface of the carrier particles.

4,111,685
DISPERSION-STRENGTHENED COBALT-BEARING METAL

Sanford Baranow, Sauquoit, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Filed Nov. 4, 1976, Ser. No. 738,770

Int. Cl.² C22C *19/00*

U.S. Cl. 75—951 **9 Claims**

1. Coarse grained oxide dispersion-strengthened metal consisting essentially of, by weight, from 18 to 35% chromium, 3 to 7% aluminum, 0.2 to 3.0% of at least one oxide dispersoid, 10 to 45% nickel, up to 10% iron, up to 0.1% boron, up to 2.0% titanium, up to 1.5% hafnium, up to 3.0% vanadium, up to 4.0% of elements from the group consisting of molybdenum, tungsten and rhenium, up to 4.0% tantalum, up to 1.0% yttrium, up to 1.0% lanthanum, up to 1.0% cerium, up to 0.1% carbon, balance essentially cobalt; said oxide dispersoid having a negative free energy of formation at 1000° C. of at least as great as that of aluminum oxide; said metal having at least 30% cobalt; said metal being characterized by a desirable combination of high temperature strength and oxidation resistance, and hot corrosion resistance.

4,111,686
PRODUCTION OF METALS AND METAL ALLOYS OF HIGH PURITY

René Antoine Pâris, 152, Cours Gambetta, Lyon 7°, Rhone; Paul Alexis Amblard, 3, rue Julien Baudran, Bron, Rhone, and Abel Claude Rousset, 37 bis, rue Jean Moulin, Caluire, Rhone, all of France

Continuation of Ser. No. 250,080, May 3, 1972, Pat. No. 3,909,247. This application Sep. 29, 1975, Ser. No. 617,846

Claims priority, application France, May 6, 1971, 71.17059; Nov. 3, 1971, 71.40191

The portion of the term of this patent subsequent to Sep. 30, 1992, has been disclaimed.

Int. Cl.² C22C *1/04, 43/00*; B22F *9/00*

U.S. Cl. 75—0.5 A **10 Claims**

1. A process for producing a metal or a metal alloy consisting essentially of the steps of forming a cyanide complex selected from the group which consists of:

$Ti[Ti(CN)_8]$;
$Zr[Zr(CN)_8]$;
$Th[Th(CN)_8]$;
$Y[Y(CN)_6]$;
$Cr[Cr(CN)_6]$;
$H_2Sm[Co(III)(CN)_6]_5$;
$H_7Nd[Ni(CN)_4]_5$
$Y[Cr(CN)_6]$;
$La[Y(CN)_6]$;
$SmBa_{0.1}H_{11.8}[Co(CN)_6]_5$; and
$Sm_{0.5}Nd_{0.25}Pr_{0.25}H_{12}[Co(CN)_6]_5$;

the complex by crystallizing it from an aqueous solution of ions of its components, and drying the crystals thus formed under vacuum or in a stream of hydrogen at a temperature of 150° to 250° C.; and reducing said cyanide complex with dry gaseous hydrogen at a temperature 700° to 1300° C.

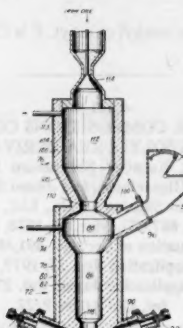
4,111,687
PROCESS FOR THE PRODUCTION OF INTERMEDIATE HOT METAL

Andrew J. Syska, Marblehead, Mass., assignor to Consolidated Natural Gas Service Company, Inc., Pittsburgh, Pa.

Filed Nov. 1, 1976, Ser. No. 737,699

Int. Cl.² C21C *5/52*

U.S. Cl. 75—13 **21 Claims**



1. A process for the production of intermediate hot metal for use in steelmaking comprising introducing a charge of ore containing oxides of iron and gangue as lumps, briquettes, pellets or other agglomerates into a reducing furnace, heating said charge in said reducing furnace by means of a reducing atmosphere comprising a mixture of top gas recycled from said reducing furnace and off-gas containing hydrogen and carbon monoxide produced in a melting unit to reduce said oxides of

iron substantially to iron, carburizing a portion of said iron to iron carbide within said reducing furnace by reacting said iron with a portion of the carbon monoxide contained in said top gas and said off-gas from said melting unit, introducing said reduced and carburized iron and said gangue together with slag forming additives and fluxes into the upper region of a melting unit, and melting said reduced and carburized iron, said gangue and said slag forming additives and fluxes under a reducing atmosphere produced by the combustion of a rich fuel/oxidant mixture to produce a molten slag and molten metal comprising essentially iron and carbon.

4,111,688
METHOD FOR SEPARATING GOLD FROM ACID AQUEOUS SOLUTION

Michio Ichijo, Kawaguchi, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Aug. 25, 1977, Ser. No. 827,463
Claims priority, application Japan, Aug. 25, 1976, 51-101416
Int. Cl.² C22B *11/10*
U.S. Cl. 75—118 R **12 Claims**

1. A method for separating gold from an acidic aqueous solution containing gold comprising the steps of:

(a) selectively precipitating metallic gold from the solution by adding a silver amalgam with 30% by weight or more of silver content to said solution and reacting gold ions with the silver amalgam at a reaction temperature of 70° C. or higher in the presence of an excessive alkali metal chloride;

(b) separating metallic gold from the solution;

(c) forming a silver amalgam with 30% by weight or more of silver content by adding a silver amargam with less than 30% by weight of silver content to the solution from the step (b), and reacting silver ions present in the solution with the silver amalgam at a reaction temperature of 70° C. or higher in the presence of an excessive alkali metal chloride;

(d) separating the silver amalgam from the aqueous solution;

(e) circulating the silver amalgam separated in the step (d) to the step (a);

(f) forming silver amalgam with less than 30% by weight of silver content by adding amalgams of a base metal having a greater ionizing tendency than mercury to the solution from the step (d) and reacting the amalgam with the silver ions and mercury ions remaining in the solution at a reaction temperature of 70° C. or higher in the presence of an excessive alkali metal chloride;

(g) separating the silver amalgam from the solution; and

(h) circulating the silver amalgam separated in the step (g) to the step (c).

4,111,689
METHOD OF STORING HYDROGEN

James Liu, Denver, Colo., assignor to Franklin Baumgartner, Denver, Colo.

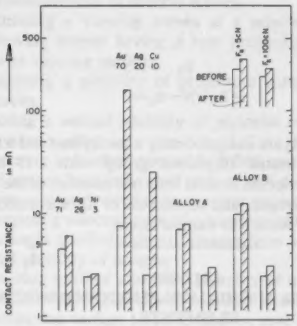
Filed Feb. 9, 1976, Ser. No. 656,402
Int. Cl.² C22C *30/00, 22/00, 38/12, 38/14*
U.S. Cl. 75—122 **5 Claims**

1. An alloy for reversibly storing hydrogen which enters into an exothermic reaction with hydrogen to form a complex therewith consisting essentially of about 31–46 weight percent titanium, 5–33 weight percent vanadium and 36–53 weight percent of a metal selected from the group consisting of iron and manganese and mixtures thereof.

4,111,690
ELECTRICAL CONTACTS WITH GOLD ALLOY

Nils Harmsen, Bruchköbel, Fed. Rep. of Germany, assignor to W. C. Heraeus GmbH, Hanau am Main, Fed. Rep. of Germany

Filed Jul. 26, 1977, Ser. No. 819,060
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637807
Int. Cl.² C22C *5/00*
U.S. Cl. 75—165 **12 Claims**



1. A gold, silver and nickel containing alloy particularly useful for electrical contacts consisting essentially of between 10 and 40% by weight silver, 2 and 25% palladium, 1 and 5% nickel, 0.1 and 10% indium, 0.1 and 3% tin, and the balance substantially gold.

4,111,691
CRUSHABLE LOW REACTIVITY NICKEL-BASE MAGNESIUM ADDITIVE

Floyd Gotthard Larson, Jr., Ringwood, N.J., and John Joseph deBarbadillo, II, Warwick, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 612,367, Sep. 11, 1975, Pat. No. 4,052,203.
This application Mar. 8, 1977, Ser. No. 775,453
Int. Cl.² C22C *19/00*
U.S. Cl. 75—170 **6 Claims**

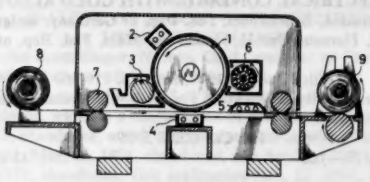
1. An addition alloy consisting essentially of, by weight, from about 3% to about 6% magnesium, iron above 20% to about 40% iron, from about 2% to about 12% silicon, up to about 2% carbon, and the balance, apart from incidental elements and impurities, essentially nickel, said nickel content of the alloy being at least about 50%, and said alloy being characterized in that it is crushable without the formation of excessive fines.

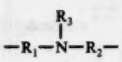
4,111,692
ELECTROSTATIC PRINTING PLATE

Kuniomi Etoh; Shinichi Tanaka; Yoshio Kato, and Watanabe Kazuo, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Jun. 4, 1976, Ser. No. 693,127
Int. Cl.² G03G *5/04;* G03F *7/02*
U.S. Cl. 96—1 R **36 Claims**

1. An electrostatic printing plate having a permanent electroconductive pattern on the exposed surface thereof, said pattern being formed by irradiation of light so as to expose a light image on a photosensitive material comprising a photosensitive composition containing an aliphatic nitrogen compound and a halogen compound capable of generating a free radical upon irradiation by light, said aliphatic nitrogen compound has one or more base units represented by the formula:





wherein R_1 and R_2 are independently a methylene and a substituted or unsubstituted alkylidene group with 1-13 carbon atoms, and R_3 is selected from at least one member of the group consisting of hydrogen, and substituted or unsubstituted alkyl or aralkyl group with 1-13 carbon atoms.

4,111,693

MULTILAYER AGGREGATE PHOTOCONDUCTIVE ELEMENTS

Hal Eldon Wright, Rochester, and Martin Alfred Berwick, Kendall, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,390

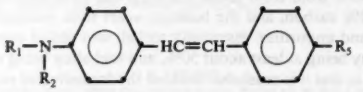
Int. Cl.[2] G03G *5/04, 5/09*

U.S. Cl. 96—1.6 **6 Claims**

1. A photoconductive insulating element having at least two layers comprising an aggregate photoconductive layer in electrical contact with a photoconductor containing layer, wherein:

(a) said photoconductor containing layer comprises an organic photoconductive material

(b) said aggregate photoconductive layer comprises (i) a continuous, electrically insulating polymer phase and (ii) a discontinuous phase dispersed in said continuous electrically insulating polymer phase comprising a finely-divided, particulate cocrystalline complex of at least one polymer having an alkylidene diarylene group in a recurring unit and at least one pyrylium-type dye salt, and (iii) at least one compound having the structure:



in which

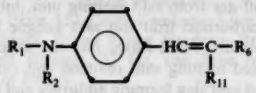
R_1 and R_2, may be the same or different, represent a substituted or unsubstituted alkyl group having from 1 to 18 carbon atoms or a substituted or unsubstituted aryl group; and

R_5 represents an electron withdrawing group, phenyl or substituted phenyl.

2. A photoconductive insulating element having at least two layers comprising an aggregate photoconductive layer in electrical contact with a photoconductor containing layer, wherein:

(a) said photoconductor containing layer comprises an organic photoconductive material

(b) said aggregate photoconductive layer comprises (i) a continuous, electrically insulating polymer phase and (ii) a discontinuous phase dispersed in said continuous electrically insulating polymer phase comprising a finely-divided, particulate cocrystalline complex of at least one polymer having an alkylidene diarylene group in a recurring unit and at least one pyrylium-type dye salt, and (iii) at least one compound having the structure:



in which

R_1 and R_2, may be the same or different, represent a substituted or unsubstituted alkyl group having from 1 to 18 carbon atoms or a substituted or unsubstituted aryl group;

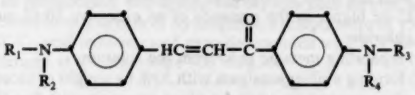
R_6 represents an electron withdrawing group, phenyl or substituted phenyl; and

R_{11} is an electron withdrawing group.

3. A photoconductive insulating element having at least two layers comprising an aggregate photoconductive layer in electrical contact with a photoconductor containing layer, wherein:

(a) said photoconductor containing layer comprises an organic photoconductive material

(b) said aggregate photoconductive layer comprises (i) a continuous, electrically insulating polymer phase and (ii) a discontinuous phase dispersed in said continuous electrically insulating polymer phase comprising a finely-divided, particulate cocrystalline complex of at least one polymer having an alkylidene diarylene group in a recurring unit and at least one pyrylium-type dye salt, and (iii) at least one compound having the structure:



in which

R_1, R_2, R_3 and R_4, may be the same or different, represent a substituted or unsubstituted alkyl group having from 1 to 18 carbon atoms or a substituted or unsubstituted aryl group.

4,111,694

METHOD FOR MANUFACTURING THE PICTURE DISPLAY SCREEN OF A COLOR TELEVISION TUBE USING A CYLINDER LENS

Jan Hendrik Duistermaat, and Johannes Cornelis Adrianus van Nes, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 352,873, Apr. 20, 1973, abandoned.

This application Jun. 28, 1974, Ser. No. 484,079

Claims priority, application Netherlands, May 9, 1972, 7206241

Int. Cl.[2] G03C *5/00*

U.S. Cl. 96—36.1 **1 Claim**

1. A method of manufacturing a color television display tube comprising a window portion and an apertured selection mask, said tube being used in conjunction with a deflection coil system having deflection coils for deflecting an electron beam in plural main directions such that said beam scans said mask, comprising the steps of: (a) providing a radiation sensitive layer on said window portion, (b) placing said mask adjacent to the radiation sensitive layer, (c) providing a light source so that the light rays emitted by it pass through the apertures in the mask at substantially the same angle as the electron beam in the manufactured tube, (d) arranging a system of lenses between the light source and the mask, said lens system having a lens power value which varies in the radial direction from its optical axis such that the virtual image of the light source formed by the associated annular zone of the system of lenses is displaced in a direction parallel to the optical axis a distance substantially equal to the displacement of the center of deflec-

tion of the electron beam in a direction parallel to the axis of the tube in accordance with the instantaneous deflection angle of the electron beam, (e) arranging a cylinder lens between the light source and the mask to compensate for differences in the displacement of said center of deflection for a given angular deflection of the electron beam in different ones of said main directions due to differences in the characteristics of the deflection coils, and (f) optically projecting by means of said light source a pattern of systematically arranged apertures in said color selection mask onto said radiation sensitive layer.

4,111,695

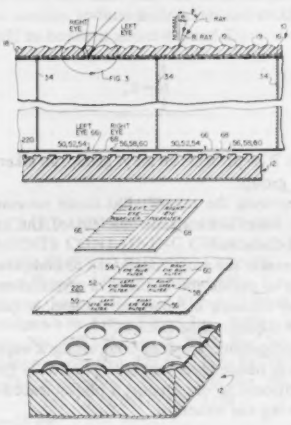
NO GLASSES 3-D VIEWER

George Johannus Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Division of Ser. No. 582,170, May 30, 1975, Pat. No. 4,012,116. This application Sep. 22, 1976, Ser. No. 725,895

Int. Cl.[2] G03C *5/04, 9/00*

U.S. Cl. 96—40 **2 Claims**



1. A method of making a three-dimensional viewing apparatus including the steps of,

(a) providing the flat surface of a lenticular lensplate with a viewing screen having the property of transmitting and diffusing light incident thereon, the lenticular lensplate having lenses on one surface thereof and having a photographic emulsion on its other surface,

(b) placing a source of illumination on the side of said lenticular lensplate which carries the lenses, the source being at a distance therefrom corresponding to the normal viewing distance of an individual,

(c) energizing said source of illumination to thereby define a first area of activated photographic emulsion beneath and corresponding to each lens of the lensplate,

moving said source of illumination laterally so that it occupies a position corresponding to the corresponding normal right eye viewing position of an individual,

(e) activating said source of illumination to thereby define a second area of photographic emulsion activation beneath and corresponding to each convex lens, said first and second areas of photographic emulsion being spaced from each other,

(f) processing the photographic emulsion so that the said first and second activated emulsion areas become transparent and the remaining, non-activated emulsion area becomes opaque, whereby the first and second emulsion areas beneath and corresponding to each lens of the lensplate define an aperture pair beneath and corresponding to each lens of the lensplate.

4,111,696

COMPOSITE IMAGE DESIGN METHOD

Jerome Sirlin, Ithaca, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,308

Int. Cl.[2] G03C *5/04, 5/06*

U.S. Cl. 96—42 **5 Claims**

1. A method of making a photograph representing a composite scene including elements of a plurality of pre-recorded scenes, said method comprising:

making a first, relatively large, plurality of selected pictorial representations of diverse scenes;

positioning a viewing screen at a selected location, said viewing screen having a rear projection surface and a front viewing surface;

positioning a plurality of projectors behind said viewing screen;

selecting a second plurality of pictorial representations of diverse scenes;

projecting individual ones of said first and second plurality of images from individual ones of said plurality of projectors onto said viewing screen rear projection surface;

superposing selected ones of said projected images;

selecting a third plurality of images from said first and second plurality of images;

projecting each of said third plurality of images from individual ones of said plurality of projectors onto said rear projection surface to be viewed on said viewing surface;

superposing said selected images from said third plurality of images on said viewing screen;

visually adjusting the size, position and illumination of each of said superposed, selected images relative to the others to produce a desired relationship of said images to be combined in said composite scene;

registering a single sheet of transparent material on said viewing screen over said superposed selected images;

drawing an outline of each of said selected superposed images on said single sheet of transparent material;

registering a single sheet of opaque medium beneath said transparent sheet so that the outlines of said selected superposed images are superposed on said sheet of opaque medium;

cutting out each outlined image from said single sheet of opaque medium by cutting through said transparent material;

retaining said cut-out images in place in said single sheet of opaque medium while leaving said superposed selected images on said viewing screen beneath said opaque medium so that the images corresponding to said cut-out images are visible through said opaque medium; sequentially removing individual ones of said cut-out images from said opaque medium,

photographically recording said selected cut-out images individually on the same frame of film by repeated exposing said same frame of film as said cut-out images are sequentially removed from said opaque medium; and

processing said same frame of film to produce a photograph representing a composite scene composed of said selected superposed images.

4,111,697

NOVEL ANTIFOGGING AND/OR STABILIZING COMPOUNDS FOR SILVER HALIDE PHOTOGRAPHY

Robert Joseph Pollet, Vremde; Antoon Leon Vandenberghe, Hove; Valére Frans Danckaert, Boechout; Jozef Frans Willems, Wilrijk, and George Frans Van Veelen, Mortsel, all of Belgium, assignors to Agfa-Gevaert, N. V., Mortsel, Belgium

Filed Mar. 10, 1977, Ser. No. 776,432

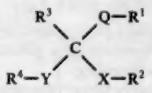
Claims priority, application United Kingdom, Mar. 29, 1976, 12596/76

Int. Cl.[2] G03C *5/30, 1/34*

U.S. Cl. 96—66.5 **5 Claims**

1. A photographic material comprising a support and at least one light-sensitive silver halide emulsion layer wherein the

emulsion layer and/or a hydrophilic colloid layer in water-permeable relationship with the emulsion layer includes a compound in a stabilizing or fog-inhibiting amount corresponding to the following general formula:



wherein:

Q is sulphur or selenium

X is sulphur, selenium or oxygen

Y is sulphur, selenium, oxygen or a single bond,

R^1 stands for an alkyl group having no nitrogen containing substituents or an aryl group,

R^2 represents the same groups as indicated for R^1, provided that only when X represents sulphur or selenium nitrogen containing substituents of alkyl are excluded,

R^3 stands for hydrogen, carboxy in acid or salt form, an alkyl group or an aryl group, and

R^4 stands for hydrogen provided Y represents a single bond, an alkyl group having no nitrogen containing substituents when Y represents sulphur or selenium and having no hydroxy substituents when Y represents a single bond and X as well as Q represent sulphur or selenium, or an aryl group,

R^3 and R^4 may also form together on alkylene group provided Y is a single bond.

4,111,698

SPIN-COATED PHOTOSENSITIVE SILVER HALIDE PHOTOMASK

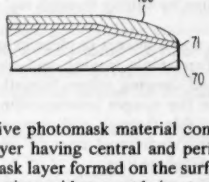
Masamichi Sato, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Jul. 30, 1976, Ser. No. 710,049

Claims priority, application Japan, Jul. 30, 1975, 50-92841

Int. Cl.[2] G03C 1/72

U.S. Cl. 96—79 **9 Claims**



1. A light-sensitive photomask material comprising a silver halide emulsion layer having central and peripheral portions spin coated on a mask layer formed on the surface of a support suitable for spin coating, said support being transparent to near ulraviolet and visible light and formed of a member selected from the group consisting of glass, silica, sapphire and quartz, said surface being flat except at the periphery where said surface is removed in an amount of at least the excess thickness at the periphery of the spin coated silver halide emulsion layer, such that the surface of said spin coated silver halide emulsion layer at the periphery is not raised in comparison to the surface of said spin coated silver halide emulsion layer at the center.

4,111,699

O-NITRO-O-AZAARYLIDENE PHOTOBLEACHABLE DYES AND PHOTOGRAPHIC ELEMENTS UTILIZING THEM

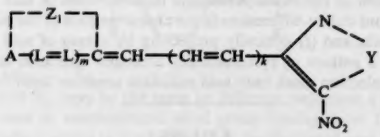
Spencer Milton Krueger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 6, 1977, Ser. No. 803,825

Int. Cl.[2] G03C 1/78, 1/84, 1/36

U.S. Cl. 96—87 R **17 Claims**

1. A photographic element comprising a support, a light sensitive layer and, incorporated in the support, in the light sensitive layer or in an otherwise non-light sensitive layer adjacent the support, a photobleachable o-nitro-o-azaarylidene dye having the structure:



wherein:

(a) *k* represents 0 or 1;

(b) *m* represents 0 or 1;

(c) each L represents a methine group;

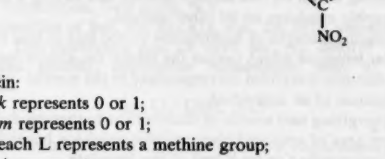
(d) A represents an electron donating moiety selected from oxygen, sulfur or

wherein R_1 represents an alkyl group, an alkenyl group or an aryl group;

(e) Z_1 represents the nonmetallic atoms necessary to complete a basic heterocyclic nucleus of the type used in cyanine dyes; and

(f) Y represents the atoms necessary to complete a pyridine nucleus, a pyridazine nucleus, a pyrimidine nucleus, a pyrazine nucleus, a quinoline nucleus, a quinaldine nucleus or a quinoxaline nucleus.

15. A photographic element comprising a support, a light sensitive silver halide layer and incorporated in the support or in a layer adjacent to the support a photobleachable antihalation dye having the structure



wherein:

(a) *k* represents 0 or 1;

(b) *m* represents 0 or 1;

(c) each L represents a methine group;

(d) A represents

where R_1 is alkyl;

(e) Z_1 represents the nonmetallic atoms necessary to complete a quinoxaline, an imidazo[4,5-b]quinoxaline or a quinoline nucleus; and

(f) Y represents the atoms necessary to complete a pyridine or pyrimidine nucleus.

4,111,700

POLYFLUORINATED AMINE OIL-REPELLENT, STAIN-RELEASE FABRIC TREATMENT

William J. Connick, Jr., and Samuel E. Ellzey, Jr., both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 272,813, Jul. 18, 1972, Pat. No. 3,976,818. This application Jun. 9, 1976, Ser. No. 694,515

Int. Cl.[2] C09K *3/18*

U.S. Cl. 106—2 4 Claims

1. A treating composition for imparting oil repellency and anti-stain properties to a textile fabric, said composition consisting of an aqueous emulsion containing about 1–5 wt. % of a product prepared by mixing equimolar amounts of 1,1-dihydroperfluorooctylamine and tetrakis(hydroxymethyl)phosphonium chloride in water in the presence of an emulsifier selected from the group consisting of an octylphenoxyethanol and a trimethylnonyloxyethanol, and to which emulsion has been added a basic substance selected from the group consisting of sodium acetate, sodium hydroxide, and triethanolamine to raise the pH to between about 4.8 and 7.1.

4,111,701

FLAME RETARDANT REGENERATED CELLULOSE FILAMENTS CONTAINING CROSS-LINKED POLYMERIC PHOSPHAZENES

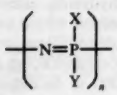
Borivoj Richard Franko-Filipasic, Morrisville; Edward F. Orwoll, Langhorne, both of Pa., and Vithal C. Patel, Glen Burnie, Md., assignors to Avtex Fibers Inc., Valley Forge, Pa.

Division of Ser. No. 458,102, Apr. 5, 1974, Pat. No. 3,994,996, which is a division of Ser. No. 225,621, Feb. 11, 1972, Pat. No. 3,845,167. This application Oct. 1, 1976, Ser. No. 728,584

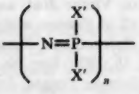
Int. Cl.[2] C08L *1/08, 1/24*

U.S. Cl. 106—15 FP 16 Claims

1. Regenerated cellulose filaments and filamentary articles, said filaments having dispersed therein a flame-retardant amount of a substantially water-insoluble, liquid polymeric phosphazene made by reacting a phosphonitriliate having the general formula:



representing both cyclic and linear oligomers, in which *n* is at least 3 for cyclic oligomers and wherein X and Y represent the same or different —OR groups wherein R is an alkyl or alkenyl radical having 2 to 6 carbon atoms, said radical being halo-substituted or unsubstituted, with an acid halide of a phosphorus acid selected from the group consisting of phosphonitrilic halide oligomers having the structure:



representing both cyclic and linear oligomers, in which *n* is at least 3 for cyclic oligomers and X′ is chlorine or bromine, POX_3', PX_3' and PSX_3' in which X′ is chlorine or bromine at a temperature of 50° to 200° C. at a pressure of 5 to 760 mm of mercury for a reaction period of 1 to 36 hours.

4,111,702

HIDDEN ENTRY OR LATENT IMAGE METHODS AND SYSTEMS

Robert D. Fraik, Lincoln Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 23,036, Mar. 26, 1970, Pat. No. 3,725,104, which is a continuation-in-part of Ser. No. 822,287, May 6, 1969, abandoned. This application Jan. 11, 1973, Ser. No. 322,620

Int. Cl.[2] C09D *11/00, 13/00*

U.S. Cl. 106—19 3 Claims

1. A crayon means for dispensing an image-forming coreactant metal salt capable of forming a colored complex with a reactant material selected from the group consisting of dithiooxamide, N,N′-disubstituted derivatives of dithiooxamide, and an iron-complexing compound capable of forming a colored complex when reacted with the ions of an iron salt, said iron-complexing compound having a benzene ring and at least two hydroxyl groups substituted in adjacent positions on said ring, said means comprising a solid wax matrix having the shape of a wax crayon, said matrix containing said coreactant material and further containing an image-forming reaction accelerator compound selected from the group consisting of trialkyl phosphates and triaryl phosphates.

4,111,703

HEAT-SENSITIVE COATING COMPOSITION WITH 4-AROMATIC AND HYDROXY SUBSTITUTED PIPERIDINE DERIVATIVE AND CYCLIC POLYKETO COMPOUND

William R. Lawton, Orchard Park, N.Y., assignor to Graphic Controls Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 772,084, Feb. 25, 1977. This application Mar. 3, 1977, Ser. No. 774,210

Int. Cl.[2] C09D *11/00*

U.S. Cl. 106—21 5 Claims

1. A heat-sensitive coating composition adapted to acquire in a region thereof a stable color constrasting visibly with a background color of said coating composition upon heating said region to an elevated temperature, containing

polymeric binder means for binding said coating composition to a substrate,

a 4-hydroxy substituted piperidine derivative selected from the group consisting of 4-benzyl-4-hydroxypiperidine, 4-hydroxy-4-phenylpiperidine and 4-(p-chlorophenyl)-4-hydroxypiperidine, and

a cyclic polyketo compound reactive with said piperidine derivative at an elevated temperature to form a color contrasting visibly with a background color of said coating composition, said cyclic polyketo compound being selected from the group consisting of ninhydrin, hydrindantin, isatin and alloxan.

4,111,704

PRINTING PASTE

Friedhelm Steinberg, Finnentrop, and Günter Voss, Neuenrade, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 782,799

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614232

Int. Cl.[2] C09D *11/14*

U.S. Cl. 106—25 1 Claim

1. A printing paste for marking non-weldable areas in the manufacture of ducted plates in which at least two metal plates are joined by sealed assembly rolling, comprising approximately equal parts by weight of

(A) a dispersion comprising

about 5 to 60% of titanium dioxide based on the weight of dispersion (A), about 0.10 to 4% of magnesium montmorillonite based on the weight of dispersion (A), up to

about 10% of silica based on the weight of dispersion (A), and the balance of water, and

(B) a dispersion comprising

about 25 to 35 parts by weight of alginate, about 50 to 70 parts by weight of silica having a submicroscopic particle size, about 2 to 4 parts by weight of highly concentrated ammonia solution, and about 1000 parts by weight of water.

4,111,705

SELF-HARDENING MOULDING MIXTURE FOR MAKING FOUNDRY MOULDS AND CORES

July Moiseevich Junovich, Veshnyakovskaya ulitsa, 11, korpus 1, kv. 201; Sergei Semenovich Zhukovsky, Profsojuznaya ulitsa, 17, korpus 1, kv. 15, both of Moscow; Lev Girshovich Sudakas, ulitsa Shelgunova, 15, kv. 6; Ljudmila Ivanovna Turkina, Tallinskoe shosse, 62, kv. 46, both of Leningrad; Anatoly Ilich Smirnov, ulitsa Novinki, 23, korpus 2, kv. 61, Moscow; Abram Moiseevich Lyass, Sharikopodshipnikovskaya ulitsa, 2, kv. 42, Moscow, and Sergei Dmitrievich Teplyakov, Seleznevskaya ulitsa, 13, kv. 3, Moscow, all of U.S.S.R.

Continuation of Ser. No. 472,914, May 23, 1974, abandoned. This application Apr. 9, 1976, Ser. No. 675,458

Int. Cl.[2] B28B *7/34*

U.S. Cl. 106—38.35 **8 Claims**

1. A self-hardening moulding mixture for making foundry mould and cores, comprising moulding sand, from 4–12% by weight of said moulding sand orthophosphoric acid, from 2–6% by weight of said moulding sand of a ferrous oxide-containing material, of from 0.05–5.0% by weight of sand moulding sand of a water-soluble salt of an alkali metal or an ammonium ion with a carboxylic acid with a dissociation constant not exceeding 10^{-4}.

4,111,706

SEALING AND FILLING MATERIAL FOR METALLURGICAL APPLICATIONS

Micheal Donald La Bate, 115 Hazen Ave., Ellwood City, Pa. 16117

Continuation-in-part of Ser. No. 689,142, May 24, 1976, abandoned. This application Oct. 5, 1977, Ser. No. 839,627

Int. Cl.[2] C04B *35/04, 35/10, 35/56*

U.S. Cl. 106—44 **4 Claims**

1. A sealing and filling material for metallurgical applications comprising a compound formed of 8% to 10% of consumable wood fiber, 45% to 50% of a non-consumable material from the group consisting of finely ground fired clay, silicon carbide, magnesite, burned dolomite, alumina, ground limestone and fine sand particles and 40% 47% of a wetting solution to bind said materials into a yieldable, shapable compound, said wetting solution consisting of an aqueous solution substantially 60% to 65% water, 5% to 15% calcium chloride and 2% to 20% phosphoric acid.

4,111,707

OPTICAL GLASS

Fujio Komorita, Hachioji; Nobuhiro Nozawa, Sagamihara, and Satoshi Inoue, Tsukui, all of Japan, assignors to Kabushiki Kaisha Ohara Kogaku Garasu Seizosho, Sagamihara, Japan

Filed Dec. 14, 1977, Ser. No. 860,428

Int. Cl.[2] C03C *3/08, 3/14*

U.S. Cl. 106—47 Q **2 Claims**

1. An optical glass substantially consisting of a composition in weight percent of 26 to 38% B_2O_3, 0.5 to 7% SiO_2, 31 to 38% La_2O_3, 17 to 30% Gd_2O_3, 1 to 7% Y_2O_3, the total of said La_2O_3, Gd_2O_3 and Y_2O_3 being 58 to 64%, 0 to 8% ZrO_2, 0 to 2% SnO_2, 0 to 2% GeO_2, an oxide or oxides selected from the group consisting of Li_2O, Na_2O and K_2O, the total of said Li_2O, Na_2O and K_2O being 0 to 0.5%, and an oxide or oxides selected from the group consisting of MgO, CaO, SrO, BaO, ZnO and Al_2O_3, the total of said MgO, CaO, SrO, BaO, ZnO and Al_2O_3 being 0 to less than 2%.

4,111,708

MACHINABLE GLASSES

James E. Flannery, and Dale R. Wexell, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,222

Int. Cl.[2] C03C *3/10, 3/8, 3/22*

U.S. Cl. 106—53 **3 Claims**

1. A phase separated, machinable glass having a composition which, as calculated in weight percent on the oxide basis from the glass batch, consists essentially of 0.3–2.5% Li_2O, 1–10% ZnO, 5–28% PbO, 4–12% B_2O_3, 45–72% SiO_2, 0–5% TiO_2 and 0–7% Al_2O_3.

4,111,709

LUTE

David Watkin Price, Cheltenham; Newton John Hodges, Charlton Kings, and Robert Furley, Gloucester, all of England, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 690,032, May 25, 1976, abandoned. This application Feb. 1, 1978, Ser. No. 874,290

Claims priority, application United Kingdom, Jul. 1, 1975, 27711/75

Int. Cl.[2] C04B *33/00*

U.S. Cl. 106—67 **5 Claims**

1. A foamable lute of clay-like consistency in admixture with a blowing agent which yields gas formation at least within the temperature range 160° to 290° C., said lute comprising an admixture of clay or pressed colliery tailings, water and at least one element selected from the group consisting of shale, coke breeze or reclaimed lute.

4,111,710

METHOD OF INCORPORATING CARBON FIBERS INTO CEMENT TO PRODUCE REINFORCED STRUCTURES HAVING IMPROVED FLEXURAL STRENGTHS

Reginald David Pairaudeau; David Turnbull, and Leonard Graham Bevan, all of Bristol, United Kingdom, assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,820

Int. Cl.[2] C04B *7/02, 7/35*

U.S. Cl. 106—90 **20 Claims**

1. In a process for incorporating strands of carbon fibers into an aqueous hardenable hydraulic cementitious matrix to produce a formable composition which can be set to produce a carbon fiber-reinforced cementitious structure, which process employs a polyethylene oxide having a molecular weight of from 500,000 to 5,000,000 to facilitate incorporation of the fibers into the matrix, the improvement which comprises employing at least 0.14 part by weight of the polyethylene oxide in the mix per 100 parts by weight of the dry components of the hydraulic cementitious matrix to deflocculate the fiber strands present and produce a composition from which structures having improved flexural strengths can be produced.

4,111,711

CEMENTS AND CONCRETES WHICH CONTAIN THEM

Jean-Pierre Kiehl, Lyon; Victor Jost, and Bernard Alain Clavaud, both of Bron, all of France, assignors to Societe Europeenne des Produits Refractaires, France

Filed Jul. 18, 1977, Ser. No. 816,753

Claims priority, application France, Jul. 22, 1976, 76 22344; May 13, 1977, 77 14717

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—97 **7 Claims**

1. A cement consisting essentially of a mixture of 10 to 30% by weight of a first ingredient, 14 to 56% by weight of a second ingredient, and 14 to 56% by weight of a third ingredient

wherein said second and third ingredients represent from 70 to 90% of the weight of the cement, and wherein

said first ingredient is at least one alkaline-earth mineral substance selected from the group consisting of calcium monoaluminate steelworks slag, calcium dialuminate steelworks slag, calcium silico-aluminate steelworks slag, calcium monoaluminate cement, calcium dialuminate cement, silicoaluminous cement, calcium silicate, barium silicate and an alkaline-earth oxide which has been calcined at very high temperature and has been selected from the sub-group consisting of magnesia, dolomite, calcium oxide and baryta; said second ingredient is at least one substance having a particle size lying between 100 A and 0.1 micron selected from the group consisting of silica, chromium oxide, titanium dioxide, zirconia and alumina; and said third ingredient is an inert filler having a particle size lying between 1 and 100 microns.

4,111,712
HIGH DENSITY ASBESTOS-FREE TOBERMORITE THERMAL INSULATION CONTAINING WOLLASTONITE

Walter George Pusch, Westford, Mass., assignor to Johns-Manville Corporation, Denver, Colo.

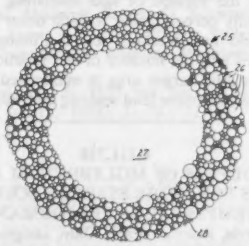
Filed Jan. 30, 1978, Ser. No. 873,199
Int. Cl.² C04B *43/02*
U.S. Cl. 106—120 **6 Claims**

1. A high density asbestos-free tobermorite thermal insulation body formed by slurrying a mixture consisting essentially of, in parts by weight: 15 to 35 parts lime, 15 to 35 parts by weight of a siliceous component, 40 to 70 parts by weight wollastonite, and 1 to 10 parts of organic fiber, and where the wollastonite content is at least 40 percent by weight of the total weight of solids, said mixture containing no asbestos fiber, in at least one part by weight water per part by weight of dry solids in said mixture; molding the slurry to a shape-retaining body having a density of a least 20 pcf; and thereafter curing said molded body in an atmosphere of steam at elevated pressure for a sufficient time to cause the lime, siliceous component, and water to form a tobermorite calcium silicate hydrate matrix reinforced by said wollastonite.

4,111,713
HOLLOW SPHERES

Warren R. Beck, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 29, 1975, Ser. No. 544,965
Int. Cl.² C03B *19/10*
U.S. Cl. 106—288 B **32 Claims**



1. A free-flowing mass of hollow spheres where individually are about 2 centimeters or less in diameter and comprise a solidified seamless spherical exterior wall that defines and encloses a central interior space, the exterior wall of the individual spheres being a composite structure that comprises a single thickness of binder material and a plurality of solid particles held by the binder material; at least a major portion of said thickness of binder material being filled by the particles, with a portion of the particles being totally embedded in the binder material, and with the outermost particles being only partially embedded in the binder material and partially exposed whereby they form the exterior surface of the sphere that contacts adjacent spheres in the mass.

4,111,714
PROCESS FOR OBTAINING AMINO ACIDS FROM THE RAW JUICES OF SUGAR MANUFACTURE

Hermann Hippchen, Saarbrucken; Hans-Georg Schneider, and Renate Schwingeler, both of Euskirchen, all of Germany, assignors to Pfeifer & Langen, Cologne, Germany

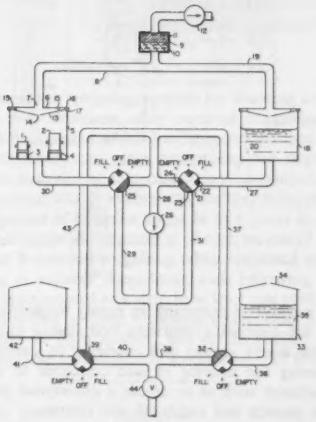
Filed Apr. 8, 1976, Ser. No. 675,014
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1975, 2515591; Apr. 10, 1975, 2515621
Int. Cl.² C13D *3/14*; C07C *99/12, 59/12, 59/16*
U.S. Cl. 127—46 A **13 Claims**

1. A process for the separation of amino acids from raw sugar juice containing impurities and amino acids, comprising coagulating the impurities in said juice, separating the juice from the coagulated impurities, passing the juice successively through an acidic cation exchanger and a basic anion exchanger thereby to adsorb the dissolved amino acids, eluting the ion exchangers with an ionic solution thereby to release the adsorbed amino acids, and collecting an amino acid-rich eluate.

4,111,715
APPARATUS AND METHOD FOR CHEMICALLY REMOVING PLASTICS

Gerhard R. Sprengling, Derry Township, Westmoreland County, and Leonard E. Edelman, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 15, 1976, Ser. No. 666,808
Int. Cl.² B08B *7/04*; C23G *1/36*
U.S. Cl. 134—10 **15 Claims**



1. A method of stripping plastic from an article and of thereafter washing and cooling the stripped article, comprising:

(1) placing said article in a first heated tank having a lid with a gas exit, said lid being comparable in size to the cross-sectional area of said tank;

(2) closing said lid;

(3) admitting a stripping fluid to said tank from a second similarly-equipped tank;

(4) after said article has been stripped of said plastic by said stripping fluid, transferring said stripping fluid back to said second tank;

(5) admitting a washing fluid from a third tank to said first tank;
(6) transferring said washing fluid back to said third tank; and
(7) opening the lid of said first tank and removing said stripped article therefrom.

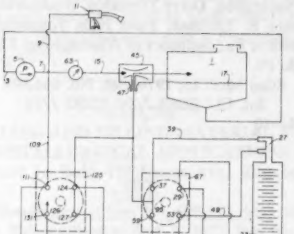
2. Apparatus comprising
(1) two heated tanks each having a removable lid with a gas exit, each lid being comparable in size to the cross-sectional area of its tank to that said cross-sectional area is substantially exposed when said lid is opened;
(2) a third tank;
(3) a one-way pump having an inlet and an outlet, conduits from each tank leading to said inlet and to said outlet, and three-way valves interconnecting said three tanks with said conduits for moving a fluid directly between any two of said three tanks without first passing through the third tank, said means including one and only one opening into each of said three tanks through which said fluid enters and leaves said tanks via said means.

4,111,716

METHOD AND APPARATUS FOR PREPARING EMPTY CHEMICAL CONTAINERS FOR DISPOSAL

James Santon Stevenson, Oakland, Calif., assignor to Terminator Products, Inc., Oakland, Calif.

Division of Ser. No. 588,417, Jun. 19, 1975. This application Oct. 22, 1976, Ser. No. 735,762
Int. Cl.[2] B08B *3/10*
U.S. Cl. 134—10 **5 Claims**



1. The method of preparing an empty hazardous chemical container for disposal, comprising first rinsing said container with a rinse liquid, sealing said container to atmosphere, and then exposing the interior of said container to a subatmospheric pressure such as to create a differential pressure between the outside and inside of said container, sufficient to collapse said container.

4,111,717

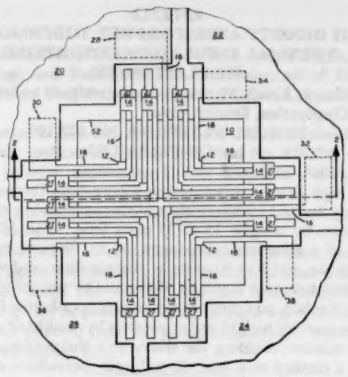
SMALL-SIZE HIGH-PERFORMANCE RADIATION THERMOPILE

Ronald Dale Baxter, Furlong, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Jun. 29, 1977, Ser. No. 811,373
Int. Cl.[2] H01L *35/32*
U.S. Cl. 136—225 **9 Claims**

1. The method of fabricating a high performance solid-backed thin film thermopile using the steps of
depositing on one surface of a crystalline wafer having a (1-0-0) crystal orientation a thin film of insulating material,
depositing on said insulating material a plurality of serially connected thermocouples formed of dissimilar conducting materials with a series of junctions located in a central portion of said wafer and intermediate junctions spaced from and circumferentially distributed outside said central portion and
anisotropically etching said water material from said insulating material in said central portion to remove said wafer material in said central portion to cause said series of junctions in said central portion to be supported solely by said thin film of insulating material.

6. An improved high-performance solid-backed thermopile for use in a radiation responsive temperature measuring device comprising
a substrate formed of a thin film of insulating material,



a support frame for said substrate having a substantially rectangular central aperature therethrough,
a plurality of first thermocouple junctions deposited on the surface of said substrate in a target area within the area corresponding with the central aperature of said support frame,
a plurality of second thermocouple junctions deposited on the surface of said substrate in the area supported by said support frame, and
a plurality of thermocouple leads connecting said hot and said cold junctions alternately in series circuit relation, said leads at said hot junctions lying in a plane corresponding with the surface of said insulating film and being substantially perpendicular to each other
whereby said hot junctions are distributed through said target area and the number of hot junctions that may be located in said target area is maximized for any preselected thermocouple lead spacing and target area.

4,111,718

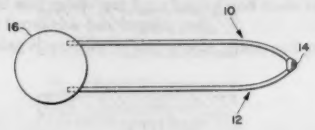
THERMOCOUPLES OF MOLYBDENUM AND IRIDIUM ALLOYS FOR MORE STABLE VACUUM-HIGH TEMPERATURE PERFORMANCE

James F. Morris, Fairview Park, Ohio, assignor to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 667,929, Mar. 18, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,679
Int. Cl.[2] H01L *35/20*
U.S. Cl. 136—236 R **2 Claims**

1. In a thermocouple for measuring temperature in high temperature and vacuum systems, the improvement comprising
a bare bimetallic thermocouple sensor of dissimilar molybdenum, iridium alloys wherein each of said bimetallic ther-

mocouple sensor metals consists of iridium with about 0 to about 22 atomic percent molybdenum dissolved therein,



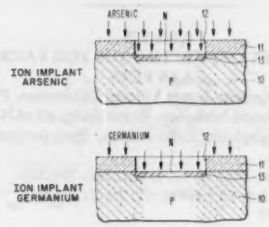
said thermocouple sensor having a melting point in the range of about 2300° C. to about 2450° C.

4,111,719

MINIMIZATION OF MISFIT DISLOCATIONS IN SILICON BY DOUBLE IMPLANTATION OF ARSENIC AND GERMANIUM

Siegfried R. Mader, Croton-on-Hudson; Burton J. Masters, Poughkeepsie, and H. Bernhard Pogge, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1976, Ser. No. 748,035
Int. Cl.[2] H01L *21/265, 9/10*
U.S. Cl. 148—1.5 **3 Claims**



1. A method for forming N conductivity-type regions in a silicon substrate comprising

ion implanting arsenic to form a region in said substrate having an arsenic atom concentration of at least 1×10^{-2} As atoms/total atoms in substrate, and

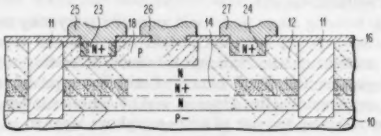
ion implanting germanium into said substrate region.

4,111,720

METHOD FOR FORMING A NON-EPITAXIAL BIPOLAR INTEGRATED CIRCUIT

Alwin E. Michel, Ossining; Robert O. Schwenker, Hopewell Junction, and James F. Ziegler, Putnam Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,245
Int. Cl.[2] H01L *21/265, 21/26*
U.S. Cl. 148—1.5 **13 Claims**



1. A method for forming an integrated circuit comprising;

forming in a silicon substrate of one-type conductivity, recessed silicon dioxide regions extending into said substrate and laterally enclosing at least one silicon substrate region of said one-type conductivity,

directing a beam of ions of opposite-type conductivity impurities at said enclosed silicon region at energy and dosage levels sufficient to form a first region of said opposite-type conductivity defined and fully enclosed laterally by said recessed silicon dioxide regions,

said opposite-type conductivity impurity having a concentration peak at a point below the surface of said first region

forming a second region of said one-type conductivity extending from said surface into said opposite-type conductivity region to a point between said concentration peak and said surface, and

forming a second region of said opposite-type conductivity extending from said surface part way into said second region of one-type conductivity.

4,111,721

STRIP CAST ALUMINUM HEAT TREATMENT

Edward Willard Hitchler, Elgin, and Albert Joseph Klein, Arlington Heights, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Jun. 14, 1976, Ser. No. 695,425
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—2 **9 Claims**

1. A process for rendering suitable for drawing and ironing manganese rich aluminum alloy material containing at least about 0.4% manganese which has been formed from the melt into a continuously cast strip, comprising the steps of: heat soaking said material of said cast strip at a temperature in a range from about 900° F to about the melting point of the alloy for a time period of between about 24 to 4 hours to form secondary constituents in the material of such increased grain size as to render it resistant to galling when subjected to drawing and ironing in suitable sheet form; and, following said heat soaking, subjecting said cast strip to at least one cold thickness reduction working to form a relatively thin sheet product of finished gage, of hard temper, and of the recited increased grain size suitable for subjection to drawing and ironing.

4,111,722

TANNIN TREATMENT OF ALUMINUM WITH A FLUORIDE CLEANER

Gary A. Reghi, Sterling Heights, and Samuel T. Farina, Mount Clemens, both of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Feb. 9, 1976, Ser. No. 656,215
Int. Cl.[2] C23F *7/00, 7/14*
U.S. Cl. 148—6.15 R **14 Claims**

1. A process for treating an aluminum surface to improve the corrosion resistance and organic finish receptivity thereof, comprising:

(a) contacting the surface with an aqueous cleaning composition exhibiting a pH not in excess of 2.0 and consisting

essentially of fluoride ion in an effective fluoride concentration of at least 0.1 g/l; and thereafter

(b) contacting the cleaned surface with an aqueous composition exhibiting a pH of from 3 to 9 and consisting essentially of a vegetable tannin material in a concentration of at least 0.000025 wt. %.

4,111,723

DIRECTIONALLY SOLIDIFIED EUTECTIC SUPERALLOY ARTICLES

Franklin David Lemkey, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

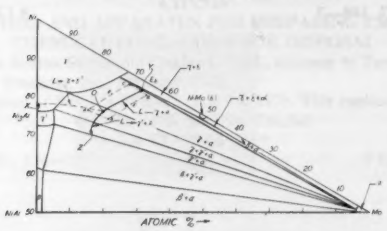
Filed Jan. 19, 1976, Ser. No. 650,474

The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.

Int. Cl.[2] C22C *19/03*

U.S. Cl. 148—32 **7 Claims**

ISOTHERMAL SECTION (1200°C) OF THE Ni-Al-Mo PHASE DIAGRAM



ATOMIC %

1. A directionally solidified article suited for use at elevated temperatures, having a structure consisting of a ductile matrix which contains the gamma phase (nickel solid solution) in continuous form, and an aligned fibrous alpha (molybdenum solid solution) ductile reinforcing phase, said region being defined by the points *a*—*b*—*c*—*d* shown in FIG. 1.

4,111,724

METHOD OF MANUFACTURING OXIDE ISOLATED SEMICONDUCTOR DEVICE UTILIZING SELECTIVE ETCHING TECHNIQUE

Katumi Ogiue; Hiroyuki Kondo, both of Tokyo; Takashi Ishikawa, Kodaira; Takaaki Mori, Ome, and Takahisa Nitta, Fuchu, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 14, 1976, Ser. No. 750,387

Claims priority, application Japan, Dec. 22, 1975, 50-151828

Int. Cl.[2] H01L *21/76, 21/306*

U.S. Cl. 148—175 **5 Claims**

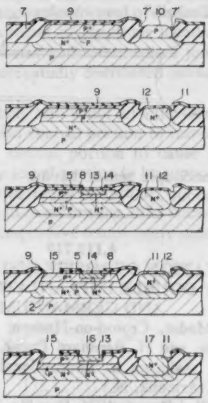
1. A method of manufacturing a semiconductor device comprising the steps of:

(a) selectively forming a first semiconductor oxide layer in a semiconductor region of a first conductivity type;

(b) forming a first heavily doped region of a second conductivity type in and extending to the surface of said first conductivity type region surrounded by said first semiconductor oxide layer and forming simultaneously a second semiconductor oxide layer at least on the surface of said first heavily doped region;

(c) forming a second region of said second conductivity type in a surface portion of said first conductivity type region, except the first heavily doped region of the second conductivity type, surrounded by said first semiconductor oxide layer, and forming simultaneously a third semiconductor oxide layer at least on the surface of said second region of the second conductivity type;

(d) simultaneously removing said second and third semiconductor oxide layers away from the surface of said first conductivity type region; and



(e) forming conducting layers on the surface of said first and second regions of the second conductivity type.

4,111,725

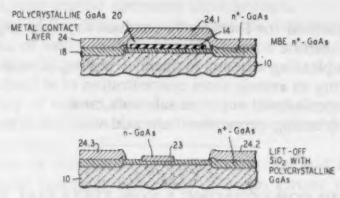
SELECTIVE LIFT-OFF TECHNIQUE FOR FABRICATING GAAS FETS

Alfred Yi Cho, Summit; James Vincent DiLorenzo, Piscataway, and Gerard Edward Mahoney, Branchburg, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 6, 1977, Ser. No. 794,336

Int. Cl.[2] H01L *21/20, 21/306*

U.S. Cl. 148—175 **2 Claims**



1. A process for fabricating a field effect transistor comprising steps of:

(a) growing a first GaAs epitaxial layer on a major surface of a semi-insulating GaAs wafer,

(b) forming on said first epitaxial layer an amorphous layer selected from group consisting of SiO_2 and Si_3N_4,

(c) opening windows in said amorphous layer to expose as source and drain regions underlying portions of said first epitaxial layer,

(d) forming mesas under said amorphous layer by subjecting the exposed portions of said first epitaxial layer to an etchant or anodization, said mesas extending to a depth greater than the thickness of said first epitaxial layer and undercutting the edges of said amorphous layer,

(e) reducing the size of said amorphous layer so as to eliminate the portions which overhang said mesas,

(f) placing said wafer in an ultra high vacuum chamber and heating said wafer to a temperature suitable for molecular beam deposition,

(g) directing molecular beams of Ga, As and a dopant at said wafer to grow GaAs epitaxial second layers in said windows and a polycrystalline GaAs layer on said amorphous layer,

(h) subjecting said amorphous layer to an etchant effective

to dissolve said amorphous layer and lift off said polycrystalline layer, thereby exposing said mesas but leaving unaffected said second epitaxial layers which laterally bound said mesas and form source and drain regions, said mesa forming a gate region, and

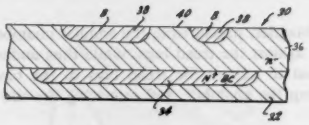
(i) forming electrodes on said source, drain, and gate regions.

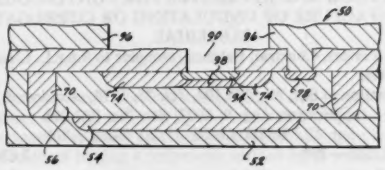
4,111,726

BIPOLAR INTEGRATED CIRCUIT PROCESS BY SEPARATELY FORMING ACTIVE AND INACTIVE BASE REGIONS

Chau-Shiong Chen, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 1, 1977, Ser. No. 783,562
Int. Cl.² H01L *21/265*
U.S. Cl. 148—175 **5 Claims**





1. In a method for fabricating a transistor in a semiconductor integrated circuit device having a substrate of a semiconductor material of a first conductivity type, a first layer of a second conductivity type and an epitaxial layer of the second conductivity type over the entire surface of the substrate burying said first layer;

the improvement comprising the steps of:

providing a silicon dioxide layer on the surface of the epitaxial layer,

depositing a layer of nitride on the oxide layer,

depositing a mask material over the nitride layer,

heat treating the device to densify the masking material,

forming openings in the mask material leaving the nitride and silicon dioxide layers intact, the center area of one of the openings remaining covered with the mask material thus selecting the emitter area and the isolation areas;

forming isolation areas through the nitride layer within the epitaxial area of the first conductivity type while said one of said areas and said center area are covered with a photoresist material,

forming a second layer of the first conductivity type to a predetermined depth through the nitride layer within the epitaxial layer while having said masked center area to prevent said second layer being formed in said area to form an inactive base surrounding the emitter area;

removing the mask material from the central area and forming a third layer of a second conductivity type to a predetermined depth within the laterial dimensions of the second layer to form an emitter;

and forming beneath the third layer by implantation through said third layer, a fourth layer of the first conductivity type lateral coextensive with the third layer and contiguous with the second layer to form an active base area.

4,111,727

WATER-IN-OIL BLASTING COMPOSITION

Robert B. Clay, 728 West 3800 South St., Bountiful, Utah 84010

Filed Sep. 19, 1977, Ser. No. 834,772
Int. Cl.² C06B *45/00*
U.S. Cl. 149—2 **21 Claims**

1. A blasting composition consisting essentially of 10 to 40% by weight of a greasy water-in-oil emulsion and 60 to 90% of a substantially undissolved particulate solid oxidizer salt constituent, wherein the emulsion comprises about 3 to 15% by weight of water, 70 to 90% of powerful oxidizer salt comprising ammonium nitrate which may include other powerful oxidizer salts, wherein the solid constituent comprises ammonium nitrate and in which sufficient aeration is entrapped to enhance sensitivity to a substantial degree, and wherein the emulsion component is emulsified by inclusion of 0.1 to 5% by weight, based on the total composition, of an oil-in-water emulsifier to hold the aqueous content in the disperse or internal phase.

4,111,728

GAS GENERATOR PROPELLANTS

Jawaharlal Ramnarace, 117 E Escalones Ave., San Clemente, Calif. 92672

Filed Feb. 11, 1977, Ser. No. 767,877
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.5 **6 Claims**

1. A castable gas generator composition comprising:

between 25 and 40 weight percent of a binder of polyether or polyester;

between 45 and 60 weight percent ammonium nitrate coated with a compound selected from the group consisting of magnesium oxide and magnesium nitrate; and an effective amount of burn rate modifier.

4,111,729

INHIBITED SOLID PROPELLANT COMPOSITION CONTAINING BERYLLIUM HYDRIDE

T. O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Wallace W. Thompson, Los Angeles, Calif.

Filed Aug. 5, 1969, Ser. No. 849,274
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.9 **5 Claims**

1. A solid composition of matter comprising:

carboxy terminated polybutadiene,

beryllium hydride,

and an amount of lecithin sufficient to inhibit any reaction between said beryllium hydride and said carboxy terminated polybutadiene during storage of the composition prior to ignition thereof.

4,111,730

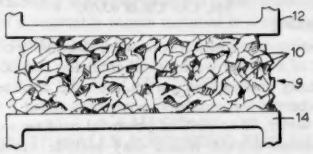
PRODUCING RECYCLE COMPOSITION PAPER FLAKE BOARD

John J. Balatinecz, 41 Bloomington Crescent, Downsview, Ontario, Canada

Continuation-in-part of Ser. No. 236,741, Mar. 21, 1972, abandoned. This application Sep. 13, 1976, Ser. No. 722,468
Int. Cl.² B31D *3/00*; B29J *5/06*
U.S. Cl. 156—62.2 **8 Claims**

1. A method of manufacturing a rigid composition paper flake board comprising the steps: fragmenting paper into flakes, adjusting the moisture content of the flakes to not more than 12% by weight of the dry paper, blending the flakes with a thermosetting synthetic resin adhesive selected from the group consisting of urea-formaldehyde and phenol-formaldehyde present in an amount of from about 2% to about 15% by weight of the dry paper, forming said paper flakes into a mat, depositing a blended mixture of wood flour or finely fragmented cellulosic matter and urea-, melamine- or phenol-formaldehyde resin in a ratio of from 1:1 to 4:1 as a layer on

surfaces of the said paper flake mat and compressing said mat at a pressure in the range of about 150 to 1000 p.s.i. at a temperature in the range of from about 200 to about 450° F for a time sufficient to cure said resin.

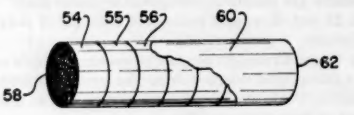


4,111,731

METHOD OF MAKING A LIGHT EQUALIZER

Henry H. Blau, Jr., Wayland, and Paul L. Kebabian, Somerville, both of Mass., assignors to Environmental Research & Technology, Inc., Concord, Mass.

Division of Ser. No. 458,124, Apr. 5, 1974, Pat. No. 3,887,262. This application Dec. 9, 1974, Ser. No. 530,673
Int. Cl.[2] B29C *27/00;* B32B *31/04*
U.S. Cl. 156—86 **2 Claims**



1. Method of making a light equalizer comprising the steps of selecting powdered crystalline material capable of being compressed to form a body transparent to selected wavelengths of light,

compressing said material and arresting compression at a point short of complete transparency at said wavelengths so as to provide a plurality of light scattering centers at said wavelengths throughout the bulk of said body;

forming a stack in which a plurality of said bodies are disposed along a common axis; and

covering with an internally reflective coating the exterior surfaces of said stack except for the two axial ends thereof said step of covering including the steps of wrapping said stack in a metallized sheet, positioning the wrapped stack within a heat-shrinkable tube, and heating said heat-shrinkable tube so as to shrink said tube sufficiently to press said metallized sheet around the periphery of said stack and to form a mechanical bond which holds said plurality of bodies of said stack along said common axis.

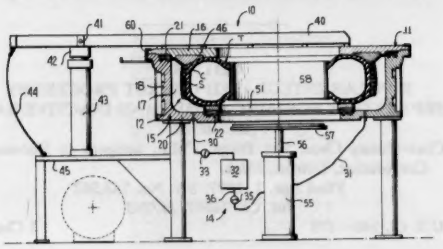
4,111,732

PROCESS OF AND MOLDS FOR APPLYING PRECURED RUBBER TIRES AND OTHER OBJECTS

Kenneth T. MacMillan, 4992 Wesleyan Woods Dr., Macon, Ga. 31204

Filed Mar. 22, 1974, Ser. No. 454,003
Int. Cl.[2] B29H *17/36*
U.S. Cl. 156—96 **10 Claims**

10. A method of retreading tires in an annular matrix defined by a pair of relatively movable annular matrix portions wherein one of the matrix portions includes a peripheral surface and an annular surface adjacent thereto which in transverse cross-section define a generally L-shaped configuration comprising the steps of applying base rubber to at least the crown of a tire, positioning the tire at least partially within the matrix with the applied base rubber in opposed relationship to the bladder, pressurizing an annular chamber in part defined by the bladder thereby urging the bladder against the base rubber, while thus under pressure applying heat to adhere the base rubber to the tire crown, depressurizing the annular chamber, removing the tire from the matrix, applying tread lugs to the base rubber, repositioning the tire at least partially within the annular matrix with the applied tread lugs in opposed relationship to the bladder, pressurizing the annular chamber to urge the bladder against the tread lugs, while thus under pressure applying heat to adhere the tread lugs to the base rubber, depressurizing the chamber, and removing the tire from the matrix.

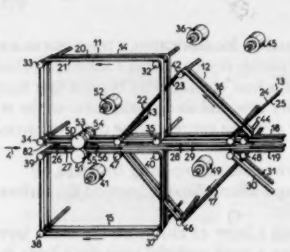


4,111,733

METHOD AND APPARATUS FOR CONTINUOUS MANUFACTURE OF UNDULATING OR CORRUGATED MATERIAL

Gilbert Periers, Courtrai, Belgium, assignor to S.p.r.L. Limatex, Belgium

Continuation of Ser. No. 598,404, Jul. 23, 1975, abandoned. This application Aug. 8, 1977, Ser. No. 823,018
Int. Cl.[2] B65H *45/10, 45/20;* D06J *1/02*
U.S. Cl. 156—204 **2 Claims**



1. A method of manufacturing folded strip material, comprising the steps of:

establishing a continuous passage receptive of a flexible strip to be folded and having a height greater than a thickness of the strip, by providing a plurality of mutually successive sets of endless belts, each set having two belts which have belt portions vertically spaced from one another to define the passage between them for folding the strip between them, each belt comprising a plurality of transversely spaced longitudinal belt straps, the straps of adjacent sets of belts being disposed in staggered array and interpenetrating one another to ensure continuity of the passage;

moving the flexible strip to be folded, at a predetermined speed, in a direction longitudinal of the strip, into and through the continuous passage;

displacing belt strap portions along the continuous passage, in said direction, at a lesser speed than said predetermined speed, to bend the flexible strip to be folded into transverse strip folds during passage of said strip between the belts, by belt strap displacing means comprising rolls

which have circumferential grooves receptive of the belt straps in said staggered array; and

decreasing said lesser speed of displacing the belt strap portions through each said successive set of belts, in said direction, to pack the strip folds in the continuous passage and thereby to produce densely folded strip material.

4,111,734

DRY TRANSFER PRODUCT AND PROCESS FOR USING SAME

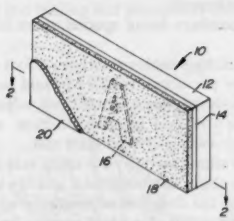
Jerome E. Rosenfeld, 1349 Lexington Ave., New York, N.Y. 10028

Continuation-in-part of Ser. No. 695,790, Jun. 14, 1976, Pat. No. 4,028,165. This application May 16, 1977, Ser. No. 797,078

The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.

Int. Cl.[2] B44C *1/16*

U.S. Cl. 156—234 **9 Claims**



1. A dry transfer material comprising a non-extensible carrier sheet constructed of a light-transmitting polymer film of low extensibility under the stresses of light rubbing or burnishing, said sheet having a polymeric surface layer which is substantially non-extensible, ink-printed indicia on said polymeric surface layer, said indicia being capable of being transferred to a receptor surface without the application of heat, and a pressure-sensitive adhesive coating overlying said indicia, said material being self-adherent to a receptor surface to which it is applied, said carrier sheet having a thickness of about 0.001 to 0.0025 inch.

4,111,735

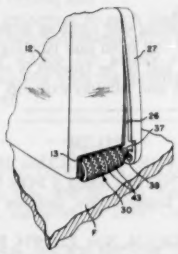
HAND-HELD LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Mar. 16, 1977, Ser. No. 778,303

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—384 **12 Claims**



1. Hand-held apparatus for printing and applying pressure sensitive labels carried on a web of supporting material, comprising: a housing having a handle, a platen and a cooperable print head mounted by the housing, means mounted by the housing for delaminating printed labels from the web, an applicator roll extending beyond the outer surface of the housing for applying printed labels, means for advancing the web about the delaminating means to dispense a label into label applying relationship with respect to the applicator roll, an actuator disposed at the handle for moving the print head into cooperation with the platen and for moving the web advancing means, the housing having an access opening through which a roll of labels can be loaded into the apparatus, a removable panel covering the access opening, a deflectable roll-mounting member mounted at a first end portion to the housing, the panel having a recess, the mounting member having a second end portion nested in the recess, the roll being rotatable on and relative to the mounting member, so that in the event the second end portion of the roll-mounting member slips out of the recess in response to excessive force applied to the applicator roll the second end portion can be readily reinserted into the recess, all without damage to the apparatus.

4,111,736

APPARATUS FOR PRINTING AND APPLYING PRESSURE SENSITIVE LABELS

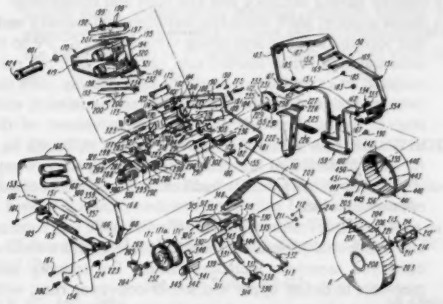
Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 658,431, Feb. 17, 1976, Pat. No. 4,075,052, which is a division of Ser. No. 476,744, Jun. 5, 1974, Pat. No. 3,957,562, which is a continuation-in-part of Ser. No. 380,445, Jul. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Jul. 22, 1977, Ser. No. 818,023

The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—384 **12 Claims**



1. Apparatus for printing and applying pressure sensitive labels carried on a web of supporting material, comprising: a frame, a platen, a print head movably mounted by the frame into and out of printing cooperation with the platen, a delaminator for delaminating printed labels from the supporting material web, an applicator for applying printed labels, a feed wheel having teeth for advancing the web and effecting label delamination at the delaminator, and means for moving the print head into printing cooperation with the platen and for thereafter moving the feed wheel for advancing the web, the moving means including ratchet teeth coupled to the feed wheel and a pawl for engaging the ratchet teeth, the moving means further including a first lever, a first pivot for pivotally mounting the lever to the frame, a second lever for effecting movement of the print head, a second pivot for pivotally mounting the second lever, a link, a third pivot for pivotally connecting the first lever and the link, a fourth pivot for pivotally connecting the link and the second lever so that pivotal rotation of the first lever in one direction causes pivotal rotation of the second lever in the opposite direction to effect movement of the print head into cooperation with the platen, and return spring means for returning the first and second

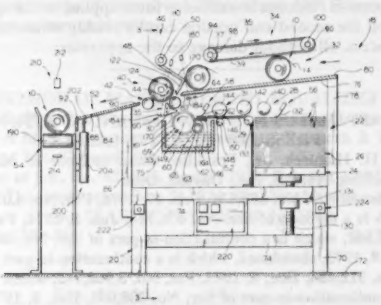
levers, the link and the print head to their initial positions and for causing the pawl to drive the ratchet tooth and advance the feed wheel.

4,111,737

APPARATUS FOR LABELING SHEETING ROLLS

John G. Wesley, Berwyn, Ill., assignor to Labelette Company, Forest Park, Ill.

Filed May 20, 1976, Ser. No. 688,368
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—458 **2 Claims**



1. Apparatus for labeling a series of convoluted sheet rolls of substantially the same diameter, and of which the outer end edge of the sheet of each roll to be labeled is free of securement against the roll, said apparatus comprising:

a runway having entrance and exit ends and comprising:

a planar support plate extending between said runway ends and forming a roller way along which the rolls are to be consecutively rolled toward said exit end, with the rolls oriented to extend transversely of said runway with the outer end edge of the sheet thereof in trailing relation with respect to the direction of rotational movement of the individual rolls along the runway, as the rolls roll in a forward direction of linear movement along the runway,

said plate being downwardly inclined in the direction of said runway exit end,

an endless conveyor extending longitudinally of said runway and above said plate and comprising one or more endless conveyor members including means for training said members to define upper and lower conveyor runs, with the lower conveyor runs being disposed above and parallel to said plate,

said conveyor lower runs being spaced above said plate for frictionally engaging the upper surfaces of such rolls, as such rolls are applied to said runway with said orientation,

and means for driving said conveyor to move said conveyor members such that said lower runs thereof move toward said runway exit end to roll the rolls applied to said runway in said direction of rotational movement along the runway toward said exit end thereof in the forward direction of linear movement,

a labeling station adjacent the exit end of said runway through which the individual rolls pass from the runway one by one,

said labeling station comprising:

a pair of spaced apart, horizontally disposed, rollers extending transversely of said direction of linear movement,

said rollers being spaced apart longitudinally of the runway direction of linear movement to receive and support the individual rolls thereon and therebetween in a labeling position for labeling in sequence one by one as the rolls enter the labeling station,

said rollers being coplanar with a horizontal plane disposed at a level adjacent to but below the level of said runway exit end,

means for rotating one of said rollers to rotate the individual rolls at a predetermined surface speed when supported by and between said rollers, and in the said direction of rotational movement,

a label supply station,

means for feeding individual labels one by one from said supply station to said labeing station at said surface speed and into adhering encircling relation to the individual rolls when rotated by said rotating means at said labeling station,

an exit ramp adjacent to and downstream of said labeling station,

and means for ejecting the labeled rolls one by one from said labeing station onto said ramp,

said ejecting means comprising:

a plurality of kicker members mounted for swinging movement about a common horizontal axis disposed above said labeling position and extending normally of said direction of linear movement,

said kicker members being spaced apart longitudinally of said axis,

said kicker members each comprising a foot element, which elements are positioned relative to said horizontal axis to simultaneously engage a labeled roll adjacent either end thereof when in said labeling position, and said kicker members are swung toward such roll,

and means for simultaneously swinging said kicker members 360 degrees about said horizontal axis in a rotational direction opposite the direction of rotational movement of said rolls in being rolled along said runway by said conveyor, for bringing said foot elements from a retracted position into engagement with the respective rolls when at said labeling position, after having been labeled, for ejecting same from said labeling station, and for returning said foot elements to said retracted position while moving same in the same direction of rotational movement,

said foot elements projecting in the direction of movement of said kicker members under the action of said swinging means, and being disposed relative to said horizontal axis to have a path of movement thereabout that is adjacent to but spaced above said labeling station rollers, whereby said kicker members on actuation of said swinging means engage a labeled roll when in said labeling position on the rearward underside thereof, with respect to the direction of movement of said rolls along said runway, to effect a lifting of such roll off the roller of said labeling station that is closest said runway exit and roll such roll over the other of said labeling station rollers onto said exit ramp,

said horizontal axis being centered between said labeling station rollers,

means for actuating said label feeding means when a roll to be labeled has moved from said runway exit end into said labeling position,

and means for actuating said ejecting means swing means to eject the labeled roll from said labeling station when the next succeeding roll to be labeled is at a predetermined position adjacent said runway exit end.

4,111,738

APPARATUS FOR PRODUCING SHRUNKEN PILFER-PROOF NECK LABELS FOR CONTAINERS

Stephen W. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 526,124, Nov. 22, 1974, Pat. No. 4,013,496, and a continuation-in-part of Ser. No. 514,370, Oct. 15, 1974, Pat. No. 3,951,292. This application May 25, 1976, Ser. No. 689,768
Int. Cl.[2] B65C *3/24, 3/20, 9/04, 9/22*
U.S. Cl. 156—458 **7 Claims**

1. Apparatus for labelling containers comprising

means for feeding a succession of rectilinear labels of a

flexible sheet-like material in an on-edge attitude in a feed path defined by a vertical feed surface,

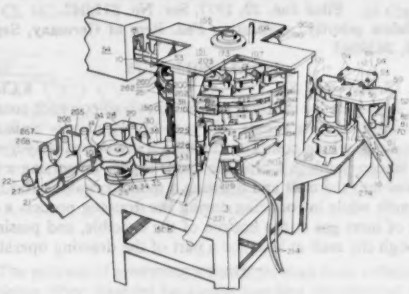
a turret rotatably supported on a vertical shaft,

plural mandrel means in circular array on said turret, each mandrel means having an annular mandrel surface rotatable about a vertical axis,

drive means connected to rotate said turret and thereby move the mandrels in an orbit tangent with the feed path whereat the mandrel surface is engageable with the leading portion of the label, said mandrel means including a vacuum means for holding said engaged leading portion on the mandrel surface, the peripheral dimension of said mandrel surface being less than the length of the label,

means connected to said rotatable mandrels surface and operable for winding said label thereon,

elongated heater means on the turret individual to each mandrel and disposed axially with respect to said mandrel, a source of heated gaseous media, means for connecting said source to said individual heater means during orbital movement of the mandrels in response to wrapping the label on the mandrel surface for heating the interface of the leading and trailing end portions of the blank just prior



to overlapping said portions on the mandrel, the said heated end portions overlapping one another on the mandrel in seam fashion, thereby forming the label into a side-seamed, hollow sleeve,

pocket wheel means connected to the turret underlying the mandrels and rotatable about said vertical shaft, said wheel means having plural container receiving pockets corresponding with the mandrels, each pocket being in underlying registry with a mandrel,

container inlet means conveying a single line of upright containers,

guide means for engaging successive containers of said single line and loading them in said pockets of the wheel means in upright position in vertical registry with an overhead mandrel, said guide means extending through a partial orbit span of movement of the mandrels defining a label transfer station, and

stripper means individual to each mandrel and operable in response to orbital movement of the mandrel through said label transfer station for axially stripping the formed sleeve downwardly from the mandrel and onto an underlying container.

4,111,739

CORNER TUCKING DEVICE FOR LAMINATED SHEETS

René Francois De Bin, and William Van der Gucht, both of Aalst, Belgium, assignors to FMC Corporation, San Jose, Calif.

Continuation of Ser. No. 626,160, Oct. 28, 1975, abandoned. This application May 19, 1977, Ser. No. 798,528

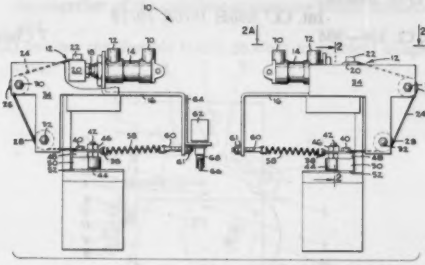
Claims priority, application Belgium, Nov. 12, 1974, 822089

Int. Cl.[2] B32B *3/04*

U.S. Cl. 156—486 **3 Claims**

1. In a wrapping apparatus for adhesively combining and laminating a thin sheet to one face, the opposed edges and partially to the opposed face of a generally rectangular relatively thick sheet, the thin sheet having its corners cut along a line defining an angle of 45° with the adjacent edges so that on folding the thin sheet to the edges and the opposed face of the thick sheet the corner of the thick sheet is covered, laminating the thin sheet to the edges and the opposed face of the thick board occurring while the sheets are being transported through the wrapper:

the improvement in adhering the thin sheet to the trailing corners and partially to the trailing edge of the thick sheet comprising laterally spaced supports each having coplanar plates along which the combined sheets are trans-



ported; a freely rotatable roller carried by each support; and means, responsive to the presence of combined sheets between said spaced supports, for moving said rollers laterally inwardly in pressure engagement with the edges of the combined sheets which are parallel to the direction of movement; said rollers being located above said plates a distance at least equal to the thickness of the thin sheet so that distortion or wrinkling thereof is prevented; said rollers being operative to maintain pressure rolling engagement with the trailing corners and the trailing edge of the thick sheet so as to adhere the thin sheet to such surfaces of the thick sheet.

4,111,740

APPARATUS FOR JOINING AXIALLY ABUTTING RODS OF THE CIGARETTE INDUSTRY

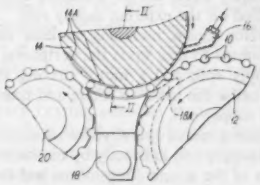
Desmond Walter Molins, London, and Tom Rowlands, Keston, both of England, assignors to Molins Limited, England

Filed Feb. 28, 1977, Ser. No. 772,678

Claims priority, application United Kingdom, Feb. 28, 1976, 7927/76

Int. Cl.[2] B65H *69/02*

U.S. Cl. 156—498 **15 Claims**



1. Apparatus for joining at least two axially abutting rods of the cigarette industry, comprising a rolling drum, means for delivering a rod assembly including at least two abutting rods in axial alignment to the rolling drum, means including a rolling device mounted adjacent to the drum to roll the rod assembly with respect to the drum, said rolling drum and said rolling device being arranged so that the rods are maintained in axial alignment as they are rolled, and means for applying a hot-melt adhesive to the rod assembly to produce a bonding film which overlaps the adjacent ends of the abutting rods and extends at

least around a major part of the circumference of the abutting rods.

4,111,741

ARRANGEMENT FOR SHUTTING OFF THE DRIVE FOR A SUPPLY ROLL

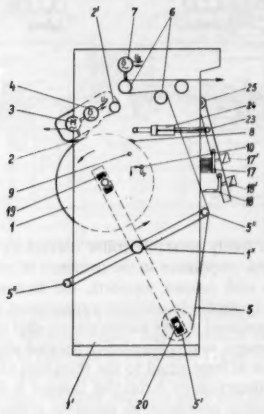
Wolfgang Paul, Leipzig, German Democratic Rep., assignor to VEB Polygraph Leipzig, Kombinat fuer Polygraphische Maschinen und Austruestungen, Leipzig, German Democratic Rep.

Filed Dec. 22, 1976, Ser. No. 753,473

Claims priority, application German Democratic Rep., Dec. 30, 1975, 190634

Int. Cl.[2] B65H *19/08, 19/18*

U.S. Cl. 156—504 **7 Claims**



1. In an autopaster of the type comprising

web transport means for pulling web off a supply roll so that the supply roll eventually nears exhaustion,

holding means holding a fresh supply roll comprised of a web whose accessible end is to be glued to the web of the supply roll which is nearing exhaustion,

severing and gluing means operative when activated for severing the web being pulled off the exhausted supply roll and gluing to the latter the accessible end of the web on the fresh supply roll so that web transport can continue,

accelerator means operative when a severing and gluing operation is to be performed for first accelerating the fresh supply roll up to a predetermined peripheral speed at least approximately equal to the transport speed of the web being pulled off the expiring supply roll,

the accelerator means including at least one accelerator roller mounted to bear upon the peripheral surface of the fresh supply roll, and a motor driving the accelerator roller to cause the latter to rotate and thereby accelerate the fresh supply roll,

speed-measuring means operative for measuring the speed of the fresh supply roll indirectly by measuring the speed of operation of the accelerating means and for generating a corresponding speed signal whereby, if contact is lost between the accelerator roller and the fresh supply roll due to lack of roundness of the fresh supply roll surface, the accelerator means will temporarily operate at a speed higher than that corresponding to the speed of the fresh supply roll and the speed signal will falsely indicate a fresh-supply-roll speed higher than the true speed of the fresh supply roll,

in combination therewith, a control system operative for causing the fresh supply roll to be brought to the predetermined speed,

the control system comprising

control means receiving the speed signal and in dependence thereon operative for causing the accelerator means to accelerate the fresh supply roll to a speed in excess of the predetermined speed, then operative for deactivating the accelerator means so that acceleration of the fresh supply roll is discontinued and the fresh supply roll begins to decelerate, then operative during such deceleration for determining when the speed of the fresh supply roll has dropped down to the predetermined speed, and in response to that determination operative for generating an enablement signal enabling activation of the severing and gluing means.

4,111,742

PROCESS FOR PRODUCING CRUCIBLE-DRAWN SILICON RODS CONTAINING VOLATILE DOPING AGENTS

Heinz-Jörg Rath; Dietrich Schmidt, both of Burghausen, and Werner Zulehner, Emmerting, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Jun. 29, 1977, Ser. No. 811,047

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1976, 2639563

Int. Cl.[2] B01J *17/18*

U.S. Cl. 156—617 SP **6 Claims**

1. A process for making crucible drawn silicon rods containing volatile doping agents, said rods having narrow resistance tolerances, which comprises melting a pre-doped polycrystalline silicon batch in a crucible under argon, immersing a seed crystal into the melt and drawing a monocrystalline rod from the melt while introducing during the drawing process a current of inert gas at the bottom of the crucible, and passing it through the melt at least for a part of the drawing operation.

4,111,743

METHOD OF RECOVERING HEAT AS WELL AS FRACTIONS CONTAINING VOLATILE ALCOHOLS AND SULPHUR COMPOUNDS FROM BLACK LIQUOR IN CONNECTION WITH PULPING

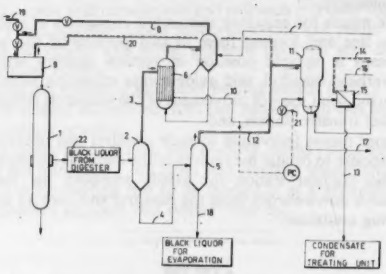
Arvi Rönnholm, Uusitie 9, 28760 Pori 76, Finland

Filed Apr. 4, 1977, Ser. No. 784,315

Claims priority, application Finland, Apr. 12, 1976, 760990

Int. Cl.[2] D21C *11/06*

U.S. Cl. 162—16 **5 Claims**



1. A method of recovering heat and fractions containing alcohols and sulphur compounds from black liquor obtained from pulping cellulosic materials which comprises

expanding black liquor removed from a digester into a low pressure vapor mixture,

passing said low pressure vapor mixture to a vapor generator where said vapor mixture is brought into indirect heat exchange contact with water,

passing the condensate formed in the vapor generator to a surface condenser while controlling the pressure to obtain

a temperature difference between said vapor mixture and said water sufficient to vaporize said water to steam, said surface condenser being at a pressure lower than the pressure of the black liquor from the digester and said steam being used for presteaming chips before introducing the chips into the digester,

cooling the condensate fraction formed in the surface condenser and the uncondensed gas fraction by indirect cooling, and

recovering the volatile alcohols and sulphur compounds from said fractions.

4,111,744

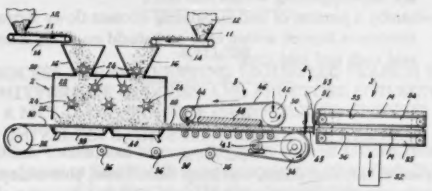
PROCESS FOR PRODUCING FUSED CELLULOSE PRODUCTS

Haigh M. Reiniger, Contentment Island, Darien, Conn. 06820

Continuation of Ser. No. 451,366, Mar. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 293,559, Sep. 30, 1972, abandoned, which is a division of Ser. No. 76,759, Sep. 30, 1970, abandoned. This application May 19, 1976, Ser. No. 687,874

Int. Cl.[2] H05B 1/00

U.S. Cl. 162—100 **14 Claims**



1. The process of producing a board product from cellulose-containing fiber material by fusion bonding together of the cellulose constituents of the fibers themselves, comprising the steps of:

(a) forming a mat from cellulose-containing fiber material in which the fibers have an interlaced fiber formation,

(b) heating opposed press platens to a temperature in the range from 450° F. to 800° F., said temperature being above the normal temperature at which said fiber material carbonizes when exposed to the air,

(c) introducing said mat into the region between said opposed press platens while the cellulose-containing fiber material in said mat has a equilibrium moisture content in the range from 2% to 50%,

(d) providing a perforated heat-conducting sheet having multiple perforations and positioned intermediate one side of said mat and at least one of said heated press platens, the perforations extending completely through said sheet and being less than three thirty-seconds of an inch in diameter and the sum total area of the perforations preferably being at least 20% of the area of the side of the sheet which is adjacent to said mat,

(e) moving said heated press platens toward each other for heating said mat by conduction of heat from said heated platens and for pressing said mat,

(f) allowing the release of heat-generated steam and gases from said mat through said perforated sheet thereby avoiding destructive pressure build-up within the mat thereby preserving the integrity of said interlaced fiber formation in said mat, allowing air from the interstices of said mat to escape through said perforated sheet together with said steam and gases,

(g) shielding said press platens for excluding the direct access of air to said mat while said mat is being heated and pressed intermediate said heated press platens,

(h) applying R.F. energy to said mat for less than 120 seconds for dielectric heating of said mat in addition to the heat conducted from said heated press platens for raising the temperature throughout said mat to a temperature above the normal carbonizing temperature of said cellulose-containing fiber material and in the range from 450° F. to 800° F. for fusion bonding together the cellulose-containing fibers themselves in the mat under heat and pressure,

(i) relieving pressure from the heated and pressed mat by opening the press platens and removing said mat therefrom,

(j) thereafter cooling the heated and pressed mat down to a temperature below 400° F. while enclosing it for excluding the direct access of air thereto for producing a durable board product which is held together by said fusion bonding together of the cellulose-containing fibers themselves, and

(k) cooling the durable board product to ambient temperature.

4,111,745

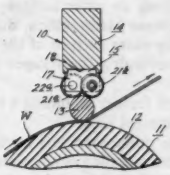
ADJUSTABLE BEARING ASSEMBLY FOR WEB DECURLING APPARATUS

John L. Manfredi, West Chester, Pa., assignor to The Moore & White Company, Philadelphia, Pa.

Filed Aug. 8, 1977, Ser. No. 822,531

Int. Cl.[2] D21F 7/00

U.S. Cl. 162—271 **9 Claims**



1. In web decurling apparatus including a roller having a resilient peripheral surface, a decurling rod extending parallel to the roller, and means for urging the decurling rod into pressure engagement with the roller for decurling a web advancing therebetween, incluing a back-up beam extending along the roller in spaced relation therewith and a series of bearing assemblies mounted to said back-up beam and engaging the decurling rod at spaced axial locations, the improvement wherein each bearing assembly comprises:

a mounting block fastened to said back-up beam,

a spindle journalled in said block to rotate about an axis parallel to said decurling rod,

an anti-friction bearing mounted on one end of said spindle,

eccentric means on said one end of said spindle mounting the bearing for rotation about an axis offset from the rotational axis of the spindle in the mountng block,

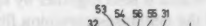
means to afford turning said spindle on its axis, and

means carried by said mounting block for releasably engaging said spindle to lock the spindle in selected adjusted position, whereby the bearing may be accurately positioned so that its surface engages the surface of the decurling rod to provide back-up support at spaced axial locations.

4,111,746
ROLLING DEVICE HAVING A CONTROLLED-DEFLECTION ROLL

Mario Biondetti, Schio, Italy, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Aug. 29, 1977, Ser. No. 828,978
Claims priority, application Switzerland, Sep. 22, 1976, 11990/76
Int. Cl.[2] D21F *3/08;* D21G *3/00*
U.S. Cl. 162—272 4 Claims



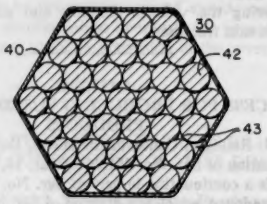
2. A roller mill equipped with a controlled-deflection roll comprising:
frame means;
a stationary roll support mounted in said frame means;
a substantially tubular roll shell;
means mounting said substantially tubular roll shell to be rotatable around said roll support;
at least one bearing element for supporting the tubular roll shell upon the roll support;
said roll shell having opposed ends;
guide members rotatably mounted at the opposed ends within the roll shell and guided on the roll support in the direction of a pressing or disengaging movement, respectively, of the roll shell;
a scraper device provided for said controlled-deflection roll;
said roll shell having an outer surface; said scraper device possessing a scraper blade which, during operation, is in contact with the outer surface of the roll shell;
means rotatably mounting the scraper device on the frame means;
said scraper device further including a blade support having at least one abutment part;
at least one of the guide members having a lift-off member which, when the roll shell carries out a lift-off movement from the operative position, abuts said abutment part of the blade support and raises the scraper blade off the outer surface of the roll shell;
when said roll shell is in its operative position there is present a gap between the lift-off member and said abutment part of the blade support which cooperates with the lift-off member; and
adjustment means for adjusting the gap between the lift-off member and said abutment part of the blade support which cooperates with said lift-off member.

4,111,747
PACKED ROD NEUTRON SHIELD FOR FAST NUCLEAR REACTORS

John E. Eck, Hempfield Township, Westmoreland County, and Alvin H. Kasberg, Murrysville, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 8, 1976, Ser. No. 693,990
Int. Cl.[2] G21C *1/02*
U.S. Cl. 176—40 13 Claims

1. A fast neutron nuclear reactor including a core and means for circulating a liquid coolant through said core, said core having a plurality of vertically oriented fuel assemblies bearing fissionable nuclear material, a plurality of vertically oriented blanket assemblies bearing fertile nuclear material, and a plurality of removable radial neutron shield assemblies disposed radially about said blanket assemblies, at least some of said shield assemblies each comprising:
(a) a metallic polygonal thin-walled enclosure duct having an internal cross-section, and
(b) a bundle of vertically disposed parallel solid cylindrical rods of a neutron shielding material closely packed within

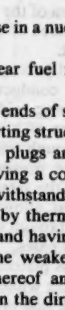


and substantially filling said duct cross-section such that said rods are held in position solely by said close-packed arrangement, said rods are contiguous with each other and are self-supporting within said duct,
whereby a portion of said circulating coolant flows through interstices formed within each said shield assembly among said rods and said duct.

4,111,748
NUCLEAR FUEL ROD WITH STRESS RELIEVING DEVICE

Kiyozumi Hayashi, Chiba, and Kenji Sato, Zushi, both of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed May 26, 1976, Ser. No. 689,987
Claims priority, application Japan, Jun. 18, 1975, 50-74145; Jun. 18, 1975, 50-83360[U]
Int. Cl.[2] G21C *3/02*
U.S. Cl. 176—68 10 Claims



1. A nuclear fuel rod for use in a nuclear reactor comprising:
a cladding tube,
a stack of pellets of nuclear fuel material encased in said cladding tube,
end plugs secured in both ends of said cladding tube,
at least one metallic supporting structure interposed between at least one of said end plugs and said pellet stack, said supporting structure having a configuration for retaining its original shape while withstanding an axial elongation of said pellet stack caused by thermal expansion under normal reactor conditions, and having substantially rigid end portions and at least one weakened portion around the entire circumference thereof and intermediate the end portions for collapsing in the direction of the axis of said cladding tube when an abnormal stress due to thermal expansion under abnormal reactor conditions is applied to said supporting structure to reduce its original supporting length, thereby dispersing a part or whole of any excess

stress which might develop in said cladding tube or at the end plug joints.

4,111,749

METHOD OF CONVERTING RACEMIC HYDANTOINS INTO OPTICALLY ACTIVE AMINOACIDS

Ludwig Degen, Rome; Aurelio Viglia, Monterotondo (Rome); Eugenio Fascetti, and Elena Perricone, both of Rome, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Jul. 9, 1976, Ser. No. 703,966
Claims priority, application Italy, Jul. 10, 1975, 25252/75
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—2 4 Claims

1. The method of preparing the "D" form of an optically active aminoacid derivative from a racemic hydantoin which comprises, subjecting said racemic hydantoin to hydrolysis in the presence of an enzymatic complex derived from the strain of microorganisms of the genus Pseudomona which is designated sp. 942 (CBS 145.75) or sp. 945 (CBS 146.75), said hydrolysis being effected at a temperature in the range of from 10° to 60° C., and at an alkaline pH in the range of from pH 7 to pH 10.

4,111,750

PROCESS FOR CONVERTING LIQUEFIED STARCH TO A MIXTURE OF GLUCOSE AND FRUCTOSE UTILIZING A MULTI-COMPONENT IMMOBILIZED ENZYME SYSTEM

William Colilla, and Norman E. Lloyd, both of Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Filed Sep. 14, 1976, Ser. No. 723,121
Int. Cl.[2] C12D *13/02*
U.S. Cl. 195—31 F 10 Claims

1. A method for producing a solution containing glucose and fructose comprising treating liquefied starch having a DE of greater than 25 with an enzyme system comprising immobilized glucoamylase, immobilized glucose isomerase and immobilized debranching enzyme said debranching enzyme being selected from the group consisting of immobilized pullulamase immobilized isoamylase and mixtures thereof at a pH and temperature whereby substantially all the starch is converted to glucose and fructose.

4,111,751

METHOD OF PURIFYING ALCOHOL DEHYDROGENASE

Louis G. Lange, III, and Bert L. Vallee, both of Brookline, Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation-in-part of Ser. No. 640,629, Dec. 15, 1975, abandoned. This application Nov. 2, 1977, Ser. No. 847,706
Int. Cl.[2] C07G *7/026*
U.S. Cl. 195—66 R 11 Claims

1. The process of purifying and fractionating crude alcohol dehydrogenase extract which comprises mixing said dehydrogenase extract with an aqueous solution containing NAD at a concentration of at least $10^{-4.5}$ molar and at a pH up to 8.0, to form a binary complex of said dehydrogenase with said NAD, bringing said mixture into contact with an affinity resin comprising pyrazole immobilized on an insoluble solid support, said pyrazole being covalently bonded at the 4-position to said support by a connecting arm having a length of at least 12 Angstrom units, to bind a pyrazole-binding fraction of said dehydrogenase and said NAD to said support, and separating said mixture containing the remaining pyrazole-insensitive fraction of said dehydrogenase from said resin.

4,111,752

COMPARATIVE TEST FOR NEISSERIA

Howard H. Weetall, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,365
Int. Cl.[2] C12K *1/04*
U.S. Cl. 195—103.5 M 10 Claims

1. A method of detecting the presence of bacteria of the genus Neisseria in a sample, the method comprising the steps of:

(a) preparing two parts identical in composition of a lysate of the sample, a first part and a second part;

(b) incubating the first part with a solution of 1,2-propanediol and nicotinamide-adenine-dinucleotide;

(c) incubating the second part with a solution of nicotinamide-adenine-dinucleotide; and

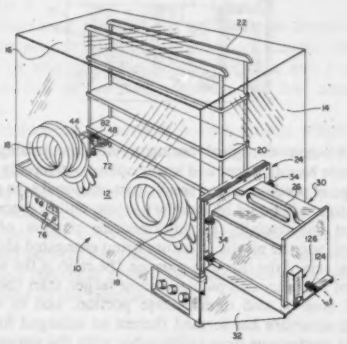
(d) comparing the incubation products of the reactions of steps (b) and (c) to determine any differences based on the presence or absence of the 1,2-propanediol, which comparison is accomplished by monitoring the concentration of reduced nicotinamide-adenine-dinucleotide.

4,111,753

CONTROLLED ATMOSPHERE APPARATUS AND METHOD OF TRANSFERRING SPECIMENS TO SAME

Max H. Folsom, Portland, Oreg., and Michael D. Dickman, Philadelphia, Pa., assignors to National Appliance Company, Portland, Oreg.

Filed Jun. 7, 1976, Ser. No. 693,624
Int. Cl.[2] C12K *1/10*
U.S. Cl. 195—126 19 Claims



1. A controlled atmosphere system comprising:

an apparatus having a base, a flexible hood joined to said base so that said hood and said base define an airtight chamber and a sealable chamber door means communicating with the atmosphere surrounding said chamber;

a transport unit adapted to dock with said apparatus such that specimens may be transferred between the interior of said unit and said chamber without admitting gas from the surrounding atmosphere into said chamber, said transport unit including a sealable transport door means communicating with the atmosphere surrounding said transport unit, both said door means comprising swinging doors which are in opposition when both of said doors are closed and said transport unit is docked with said apparatus; and

support means to maintain said transport unit at the level of said chamber door means when said transport unit is docked.

18. A method of transferring an atmosphere-sensitive article from a remote location to a controlled atmosphere apparatus having an airtight chamber filled with a special gaseous medium comprising:

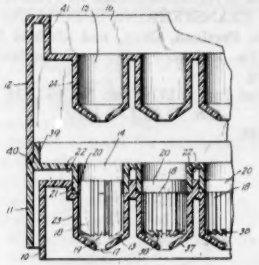
enclosing an atmosphere-sensitive article in an interior zone of an airtight transport unit;
circulating a special gaseous medium through said zone to displace any residual air located therein;
transporting the transport unit, containing said article and a volume of said special gaseous medium, to a controlled atmosphere apparatus;
docking said transport unit with said apparatus to form an airlock compartment therebetween;
circulating a special gaseous medium into said zone, from said zone into said compartment and from said compartment into the surrounding atmosphere to displace any residual air trapped in said compartment as a result of said docking; and
transferring said articles from said zone through said compartment and into said apparatus.

4,111,754

IMMUNOLOGICAL TESTING DEVICES AND METHODS

Hydow Park, 2 Red Hill Rd., Warren, N.J. 07060

Filed Nov. 29, 1976, Ser. No. 745,541
Int. Cl.² C12K 1/10; G01N 31/14
U.S. Cl. 195—127 **11 Claims**



1. An immunological testing device comprising: a plastic structure having upper and lower open ends, having a through-passage of predetermined small cross-sectional area sufficiently small to retain liquid by capillary action within space thereof at at-least substantially an intermediate portion of a length thereof, and the plastic structure being elongated along a longitudinal axis of the through-passage, the ratio of the wall surface area of said through-passage being larger than the cross-sectional area of said intermediate portion, and in which said plastic structure has formed therein an enlarged funnel structure in continuous flow-relationship with the upper end of the intermediate portion of the through-passage of said predetermined small cross-sectional area.

4,111,755

METHOD OF PRODUCING PELLETIZED FIXED SULFUR FUEL

Thomas E. Ban, South Euclid, and Ashok D. Rao, Euclid, both of Ohio, assignors to McDowell-Wellman Engineering Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 627,240, Oct. 30, 1975, abandoned. This application Jan. 27, 1977, Ser. No. 763,226
Int. Cl.² C10B 53/08, 57/06, 57/10
U.S. Cl. 201—6 **13 Claims**

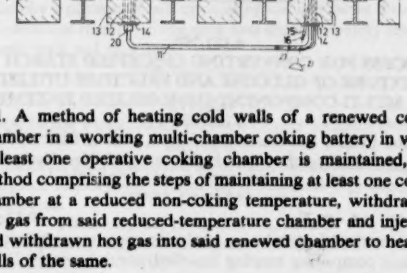
1. A method of producing pelletized, fixed sulfur oxidation fuel and for producing ash having sulfur fixed therein consisting essentially of the steps of preparing an intimate mixture, said mixture consisting essentially of a particulate coal containing sulfur and hydrocarbonaceous volatile matter and a basic material, forming the mixture into pellets, heating said pellets to a temperature exceeding about 800° F. to cause substantial depletion of the hydrocarbonaceous volatile matter, calcination of the basic material, and fixation of at least some of the sulfur as a sulfide of the basic material, and converting the sulfide to a sulfate by burning said pellets as a fuel under oxidizing conditions thereby producing ash having sulfur fixed therein.

4,111,756

METHOD OF AND APPARATUS FOR HEATING UP A CHAMBER OF A COKING BATTERY

Günther Lagemann, and Wilhelm Heisterkamp, both of Essen, Germany, assignors to Krupp-Koppers GmbH, Essen, Germany

Filed Nov. 12, 1976, Ser. No. 741,186
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1976, 2551197
Int. Cl.² C10B 23/00, 27/00
U.S. Cl. 201—41 **7 Claims**



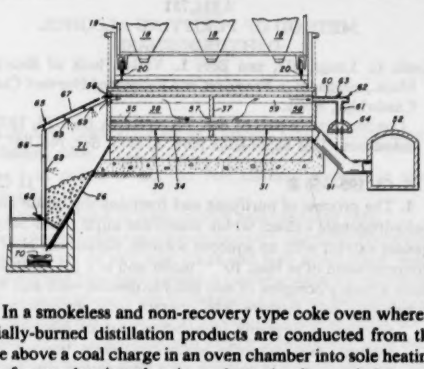
1. A method of heating cold walls of a renewed coking chamber in a working multi-chamber coking battery in which at least one operative coking chamber is maintained, said method comprising the steps of maintaining at least one coking chamber at a reduced non-coking temperature, withdrawing hot gas from said reduced-temperature chamber and injecting said withdrawn hot gas into said renewed chamber to heat the walls of the same.

4,111,757

SMOKELESS AND NON-RECOVERY TYPE COKE OVEN BATTERY

Joseph P. Clarimboli, Greensburg, Pa., assignor to Pennsylvania Coke Technology, Inc., Greensburg, Pa.

Filed May 25, 1977, Ser. No. 797,141
Int. Cl.² C10B 9/00, 39/18
U.S. Cl. 202—93 **11 Claims**



1. In a smokeless and non-recovery type coke oven wherein partially-burned distillation products are conducted from the space above a coal charge in an oven chamber into sole heating flues for combustion therein to heat the floor of the oven chamber and thence the partially-burned distillation products are fed from the sole heating flues into checker-filled ignition chambers coupled to an air supply to incinerate the unburned distillation products for discharge by means into the atmosphere, the coke being discharged from the oven chamber

through a removable door at the coke side of the coke ovens, the improvement comprising the combination therewith of:

a downwardly-inclined ramp at the coke side of the oven chamber to support coke discharged therefrom,

means to discharge a coolant medium for cooling the coke while supported by said ramp,

a smoke hood including a roof joined with side walls to form an enclosure overlying said ramp to receive smoke and effluent liberated and rising from the coke on the ramp during cooling of the coke, and

means defining a closable passageway to conduct said smoke and effluent from beneath said smoke hood into said checker-filled ignition chambers for incineration of the effluent, the closable passageway including a closure member to interrupt communication with the ignition chambers after cooling of coke on said ramp, the arrangement of parts being such that the smoke from the smoke hood undergoes conversion within the ignition chambers to clean hot air.

4,111,758

APPARATUS FOR THE UNIFORM DISTRIBUTION OF COMBUSTION MEDIA IN A BATTERY OF COKE OVENS

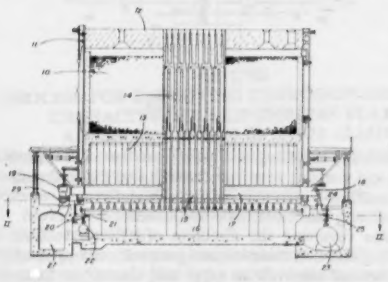
Folkard Wackerbarth, Bochum, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 765,889

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604871

Int. Cl.[2] C10B *5/12, 21/06*

U.S. Cl. 202—138 **5 Claims**



1. Apparatus to insure uniform distribution of combustion media into and from rows of individual heating flues in a battery of coke ovens which include regenerators for heat exchange between uncombined combustion media and burnt gases, the rows of heating flues including burners, some of which are supplied with rich-gas through rich-gas distribution branch lines communicating with a rich-gas supply header extending along the battery of coke ovens, the remaining burners are supplied with lean-gas through lean-gas distribution branch ducts communicating with a lean-gas supply header extending along the battery of coke ovens, valve means to control the supply of lean-gas by said lean-gas supply header, valve means to control the supply of rich-gas by said rich-gas supply header, the rows of heating flues being connected by said regenerators through individual smoke-gas valves in smoke-gas ducts communicating with a smoke-gas collecting duct extending along the battery of coke ovens, said apparatus comprising the combination therewith of substantially identical rich-gas flow resistance elements in each of said rich-gas distribution branch lines, substantially identical lean-gas flow resistance elements in each of said lean-gas distribution branch ducts and substantially identical smoke-gas flow resistance elements in each of said smoke-gas ducts to insure uniform, adequate distribution of combustion media into and from the individual rows of heating flues.

4,111,759

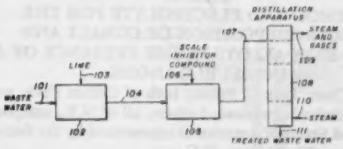
PROCESS FOR SEPARATING AMMONIA AND ACID GASES FROM WASTE WATERS CONTAINING FIXED AMMONIA SALTS

William J. Didycz, Whitehall Borough; Donald Glassman, Mount Lebanon Borough; Edward E. Maier, Plum Borough, and George T. Saniga, Penn Hills Township, Allegheny County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 8, 1976, Ser. No. 703,408

Int. Cl.[2] B01D *3/38*

U.S. Cl. 203—7 **45 Claims**



1. A process for separating acid gases and ammonia from a dilute aqueous solution thereof, said solution being derived from a coal conversion process and also containing free and fixed ammonia salts but containing sulfate ion in a concentration of less than about 1500 ppm, said process comprising:

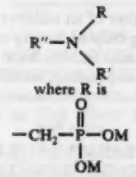
(a) subjecting said solution to a first counter-current multistage continuous distillation, said distillation being conducted by having a gradient of ammonia concentration decreasing towards the region of bottom liquid withdrawal which results in said bottom liquid having a pH of less than 8,

(i) withdrawing an overhead vapor stream containing a major proportion of stripping vapor, a major proportion of said acid gases in said solution, and a major proportion of the ammonia from said free ammonia salts,

(ii) withdrawing an aqueous bottom stream which contains a major proportion of water and substantially all of said fixed ammonia salts;

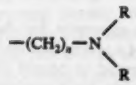
(b) adding lime to said withdrawn bottom stream, said lime being added in an amount sufficient to form an insoluble precipitate and evolve ammonia contained in the fixed ammonia salts during a second distillation of said mixture;

(c) adding a threshold amount of at least one scale inhibitor compound of the general formula



where R is

R′ is selected from the group consisting of R and $-CH_2CH_2OH$, and R″ is selected from the group consisting of R, $-CH_2CH_2OH$, and



where each M is independently selected from the group consisting of H, NH_4, and alkali metal, "*n*" is a whole number from 1 to 3, to said dilute aqueous solutions to thereby inhibit the deposition of scale on the trays of the distillation towers; and

(d) subjecting said withdrawn bottom stream to a second countercurrent multi-stage continuous distillation,

(i) withdrawing an overhead vapor stream, said vapor stream containing a major proportion of stripping vapor and a portion of the ammonia from the fixed ammonia salts, and

(ii) withdrawing an aqueous bottom stream, said stream having a substantially reduced concentration of acid gases and ammonia are compared to said aqueous solution.

4,111,760
METHOD AND ELECTROLYTE FOR THE ELECTRODEPOSITION OF COBALT AND COBALT-BASE ALLOYS IN THE PRESENCE OF AN INSOLUBLE ANODE

Edward S. Chen; John C. Sadak, both of Clifton Park, and G. Raman Lakshminarayanan, Latham, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 736,901, Oct. 29, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,766

Int. Cl.[2] C25D *3/12, 3/56, 5/02, 7/04*

U.S. Cl. 204—26 **8 Claims**

1. A method for electroplating cobalt on the interior surfaces of a metallic tubular cathode having a bore diameter of less than 20mm, comprising the steps of,

preparing an electrolyte consisting of from 250–450 grams/-liter of cobalt sulfate in aqueous solution, sufficient sulfuric acid to provide a pH ranging from 1.0–2.0 in value, and about 30–40 grams/ liter of boric acid for stabilizing the pH,

adding to the electrolyte a sufficient quantity of the salt or oxide of the metal selected from the group consisting of vanadium, titanium, and molybdenum to provide a concentration of 1.3–2.4 grams/liter of corresponding metallic ions, and

electrolyzing the resulting solution by the passage of from 2–10 amperes per square decimeter at a temperature from about 20° C. to 60° C. in the presence of an insoluble anode to produce a cobalt deposit of uniform thickness.

7. An electrolyte for electroplating cobalt on the interior bore surfaces of steel tubes, consisting essentially of,

from 250–450 grams/liter of cobalt sulfate in aqueous solution,

sufficient sulfuric acid to provide a pH ranging from 1.0–2.0 in value at a temperature from about 40° C. to 60° C.,

from 30–40 grams/liter of boric acid for stabilizing the pH, and

from 2.3–4.3 grams/liter of an additive metallic salt or oxide selected from the group consisting of vanadium, titanium, and molybdenum salts and oxides to provide from 1.3–2.4 grams/liter of corresponding metallic ions.

4,111,761
METHOD AND APPARATUS FOR FLOW-THROUGH PLATING INCLUDING PNEUMATIC ELECTROLYTE SHUTTLING SYSTEM

Mitchell A. LaBoda, East Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1977, Ser. No. 848,926

Int. Cl.[2] C25D *5/08, 17/00, 21/10*

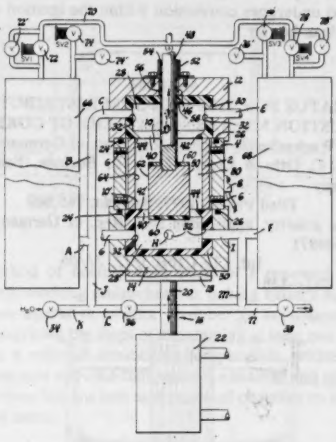
U.S. Cl. 204—26 **5 Claims**

1. In electroplating apparatus for the rapid deposition of metal on the surface of a workpiece including, an open ended electroplating cell adapted to permit electrolyte flow therethrough, means for positioning a workpiece in said cell, means for positioning an anode in said cell in spaced relation to said workpiece such as to provide a gap therebetween through which electrolyte can flow during plating, and inlet and outlet means for continuously supplying and withdrawing electrolyte to and from said cell, the improvement comprising:

a pneumatic system for shuttling electrolyte between said inlet and outlet means and through said gap during plating, said system comprising, first and second pneumatically pressurizeable and ventable reservoirs for alternately and oppositely delivering and receiving said electrolyte, conduits connecting said inlet and outlet means with said reservoirs;

a source of pneumatic pressure; and means for alternately and oppositely pressurizing and venting said reservoirs to effect said shuttling.

5. In a method of operating a flow-through electroplating cell including a cathodically polarized workpiece, a reciprocating anode spaced from said workpiece by a gap through which electrolyte flows during plating and cell inlet and outlet means for continuously providing and withdrawing electrolyte to and from said cell, the improvement comprising during plating repeatedly:



pneumatically expelling said electrolyte from a first pressurized and ventable reservoir through said gap in one direction and into a second pressurizeable and vented reservoir;

accumulating said electrolyte in said second reservoir;

thereafter reversing the direction of electrolyte flow by venting said first reservoir and pneumatically pressurizing said second reservoir to expel said electrolyte from said second reservoir through said gap in the opposite direction and return it to said first reservoir; and automatically coordinating said flow reversal with the direction reversals of said anode such that said electrolyte always flows through the gap in the opposite direction to the direction of the anode;

whereby said workpiece is incrementally plated as said electrolyte is pneumatically shuttled back and forth through said gap and between said reservoirs providing fresh flowing electrolyte in the gap and minimizing polarization effects within the cell.

4,111,762
OPTICALLY BLACK COATING AND PROCESS FOR FORMING IT

Jackie F. Wade, Littleton; John E. Peyton, Arvada; Bruce R. Klitzky, and Roy E. Groff, both of Denver, all of Colo., assignors to Martin Marietta Corporation, Bethesda, Md.

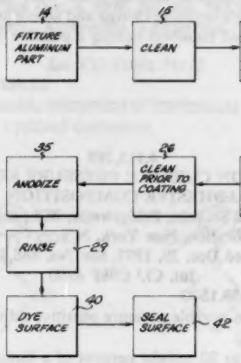
Continuation of Ser. No. 545,920, Jan. 31, 1975, abandoned, which is a continuation-in-part of Ser. No. 309,880, Nov. 27, 1972, abandoned. This application Jan. 13, 1977, Ser. No. 758,951

Int. Cl.[2] C25D *11/08, 11/18, 11/24*

U.S. Cl. 204—33 **22 Claims**

1. In a method of improving the absorbency of electro-magnetic radiation of an oxide layer produced on the surface of an

anodizable metal selected from aluminum and aluminum alloys by sulfuric acid anodization at from about 80° F. to 100° F. and a voltage between about 12 to 25 volts for from 1.5 to 2.5 hours in a sulfuric acid solution having a specific gravity of from 1.10 to 1.13 measured at 70° F. the improvement which



comprises heating said layer under a pressure no greater than about 1 mm Hg. at a temperature of at least 105° C. to remove moisture therefrom, and contacting said surface with hydrogen fluoride gas in an amount sufficient to raise the pressure to at least about 50 mm. Hg. for a period of time sufficient to render said layer resistant to re-absorption of moisture.

4,111,763

PROCESS FOR IMPROVING CORROSION RESISTANT CHARACTERISTICS OF CHROME PLATED ALUMINUM AND ALUMINUM ALLOYS

Michael J. Pryor, Woodbridge, Conn., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 18, 1977, Ser. No. 816,315
Int. Cl.² C25D *5/44, 5/30;* **B32B** *15/20*
U.S. Cl. 204—38 A **8 Claims**

1. A process for preparing aluminum and aluminum alloy objects for chrome plating by standard plating techniques and enhancing the corrosion resistance thereof, said process comprising anodizing said object in an acid bath to form an anodic coating, impregnating said anodic coating with a pyrolyzable metal salt, and pyrolyzing said impregnated anodic coating to form an electronically conductive oxide thereby allowing plating of said object by standard plating techniques.

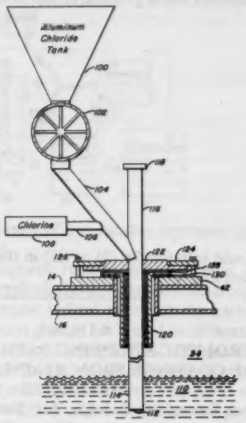
4,111,764

METHOD FOR FEEDING A SUBLIMING MATERIAL INTO A LIQUID

Robert A. Stoehr, Pittsburgh; Robert J. Ormesher, Leechburg, and Stanley C. Jacobs, Lower Burrell, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed May 17, 1977, Ser. No. 797,779
Int. Cl.² C25C *3/00*
U.S. Cl. 204—64 R **5 Claims**

1. A method of feeding a subliming, particulate material into a liquid in a container, the liquid being above sublimation temperature, wherein the improvement comprises submerging a terminal orifice of a pipe in the liquid; the container being sufficiently large that liquid surrounds the terminal orifice; and transporting the subliming, particulate material through the pipe and into the liquid in accompaniment with a flow of gas, at a gas flow rate for preventing the formation of deposits of



the subliming material by countercurrent gaseous diffusion of the subliming material.

4,111,765

SILICON CARBIDE-VALVE METAL BORIDES-CARBON ELECTRODES

Vittorio De Nora, Nassau, The Bahamas; Antonio Nidola, and Placido Maria Spaziante, both of Lugano, Switzerland, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 754,025, Dec. 23, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,834
Int. Cl.² C25B *1/34, 11/00, 3/06, 7/02*
U.S. Cl. 204—67 **5 Claims**

1. A sintered anode consisting essentially of 40 to 90% by weight of at least one boride of a metal selected from the group consisting of titanium, tantalum, zirconium, aluminum, hafnium, niobium, tungsten, yttrium, molybdenum and vanadium, 5 to 40% by weight of silicon carbide and 5 to 40% by weight of carbon.

3. In a process for direct current electrolysis of a liquid electrolyte between an anode and a cathode, the improvement wherein the anode is an electrode of claim **1**.

4,111,766

PROCESS FOR THE RECOVERY OF SILVER FROM FIXING SOLUTIONS

Yoshio Idota, and Haruo Shibaoka, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

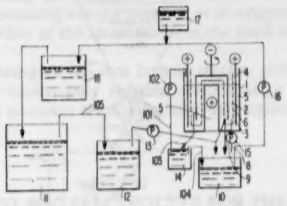
Filed Aug. 25, 1976, Ser. No. 717,797
Claims priority, application Japan, Aug. 25, 1975, 50-102756
Int. Cl.² C25C *1/20*
U.S. Cl. 204—109 **30 Claims**

1. A process for the recovery of silver from a fixing solution used in processing a silver halide photographic light-sensitive material comprising subjecting the used fixing solution to electrolysis at a current density of about 0.05 to about 1 A/dm² in an electrolytic cell, wherein the electrolytic cell comprises a cathodic cell and an anodic cell separated by a porous polymer film having a pore size of about 0.1 to about 0.7 microns, the silver is recovered from the used fixing solution in the cathodic cell, and the anodic cell is filled with

i. a fixing solution which as been used in photographic processing;

ii. a fixing solution which has not been used in photographic processing; or

iii. a fixing solution which has already been subjected to the electrolysis



wherein said solution (i), (ii) or (iii) in the anodic cell contains ammonium ion.

4,111,767

ELECTROLYTIC STRIPPING BATH FOR REMOVING METAL COATINGS FROM STAINLESS STEEL BASE MATERIALS

Shigemitsu Kawagishi, Kadoma, and Yasunori Arisato, Daito, both of Japan, assignors to Okuno Chemical Industry Co., Ltd., Osaka, Japan

Filed Dec. 14, 1977, Ser. No. 860,454
Claims priority, application Japan, Dec. 7, 1977, 52-147673
Int. Cl.[2] C25F *5/00*
U.S. Cl. 204—146 **4 Claims**

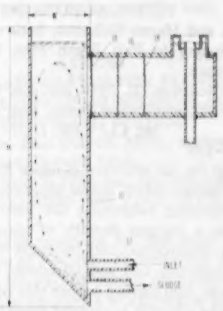
1. An electrolytic stripping bath for removing metal coatings from stainless steel base materials comprising about 50 to about 500g/*l* of a water/soluble nitrate, about 1 to about 200 g/*l* of a chlorine ion donor about 0.5 to about 200 g/*l* of at least one of amine compounds and organic acids having a buffering action, and about 1 to about 100 g/*l* of at least one reducing compound selected from the group consisting of dimethylformamide, formaldehyde, thiosulfates, sulfites, hydrazine, hydroxylamine and dimethylaminoboron, the stripping bath having a pH of 6.0 to 9.5.

4,111,768

METHOD OF SEPARATING SOLIDS FROM A FLUID SYSTEM

Ferenc J. Schmidt, Ardmore, Pa., assignor to Ametek, Inc., Paoli, Pa.

Continuation-in-part of Ser. No. 601,253, Aug. 4, 1975, Pat. No. 4,053,386, and Ser. No. 515,915, Oct. 18, 1974, Pat. No. 4,014,767. This application Feb. 16, 1977, Ser. No. 769,031
Int. Cl.[2] B03C *5/00*
U.S. Cl. 204—151 **21 Claims**



1. Method of concentrating and separating from electrolytic aqueous solution colloidally suspended, finely divided, difficultly separable material, said method comprising passing said solution in combination with said colloidal suspension sequentially through a first porous sheet electrically conductive filter member and thereafter through a gas bubble-impervious, electrically non-conductive separator material and then a second porous sheet electrically conductive member while imposing an electrical potential between said members and establishing an electrolytic current therebetween with the first of said members having a negative charge and acting as a cathode and the second of said members having a positive charge and acting as an anode.

4,111,769

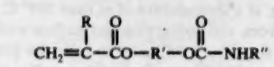
RADIATION CURABLE PRESSURE SENSITIVE ADHESIVE COMPOSITION

Kenneth Charles Stueben, Bridgewater, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,630
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.15 **7 Claims**

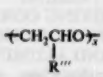
1. A radiation curable pressure sensitive adhesive composition comprising:

(A) from 35 to 80 weight percent of a liquid carbamyloxy alkyl acrylate of the formula:



wherein R and R'' are each, individually, hydrogen or alkyl from 1 to 3 carbon atoms, R' is alkylene of 1 to 3 carbon atoms;

(B) from 20 to 65 weight percent of a polyoxyalkylene homopolymer or copolymer which is characterized by the repeating units:



wherein each R''' is hydrogen or methyl and a sufficient number of the R''' substituents are hydrogen that from 40 to 100 percent by weight of the oxyalkylene units in the polymer are oxyethylene units and from 60 to 0 percent by weight are oxypropylene units; and *x* is a number such that the molecular weight of the polyoxyalkylene homopolymer or copolymer is from 1,700 to 90,000; and

(C) from 0.1 to 10 weight percent of a photoinitiator.

4,111,770

RADIATION CURABLE EPOXY RESIN

Daniel J. Najvar, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 9, 1975, Ser. No. 575,881
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.15 **10 Claims**

1. A radiation curable resin prepared by (a) polymerizing to substantial completion a mixture of vinyl monomers, in the presence of a polyepoxide having more than one 1,2-oxirane groups per molecule, wherein the mixture comprises about 2 to 20 weight percent of a vinyl acid and the balance to make 100 percent of one or more copolymerizable monovinyl monomers, (b) deactivating any residual addition polymerization catalyst and (c) reacting with the product of step (a) an unsaturated monocarboxylic acid; wherein the total acid equivalents per oxirane equivalent vary from about 0.8 to 1.2 and wherein the vinyl acid of step (a) comprises about 1 to 10 percent of the total acid equivalents.

4,111,771

CROSSLINKABLE TETRA-IMIDYL DERIVATIVES AND CROSSLINKED POLYMERS THEREFROM

Roland Darms, Therwil; Vratislav Kvita, Muttenz, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

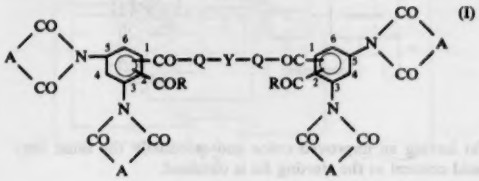
Filed Dec. 6, 1976, Ser. No. 747,757

Claims priority, application Switzerland, Dec. 19, 1975, 16513/75

Int. Cl.² C08G *73/12*

U.S. Cl. 204—159.22 **12 Claims**

1. A crosslinkable compound of the formula I, as well as the corresponding cyclized derivative,

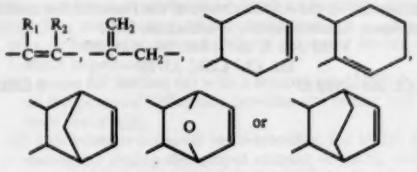


(I)

wherein

a carbonyl of the —COQYQOC— moiety and a —COR group are attached in pairs to adjacent carbon atoms at the 1- and 2-positions of the benzene rings, whereby on each benzene ring one of said carbonyl and —COR groups can be in the 1-position and the other in the 2-position,

the Rs independently of one another represent a hydroxyl group, phenoxy; phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; alkoxy of 1 to 18 carbon atoms or an $—O^-M^+$ group, the A's independently of one another represent a radical of the formula

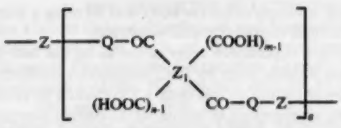


R_1 and R_2 independently of one another represent hydrogen, chlorine, bromine or methyl,

M^+ represents an alkali metal cation, a trialkylammonium cation having 3–24 carbon atoms, or a quaternary ammonium cation,

Q represents —NH—, and

Y represents an aliphatic radical having at least two carbon atoms, a cycloaliphatic, a carbocyclic - aromatic or a heterocyclic - aromatic radical, or



(II)

wherein

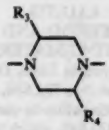
a represents a number from 1–100, and the individual symbols *m*, *n*, Q, Z and Z_1 independently of one another have the following meanings:

m and *n* represent the number 1 or 2,

Q represents —NH— and

Z represents an aliphatic radical having at least two carbon atoms, a cycloaliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical, or

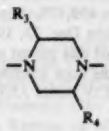
Q and Z together with the adjacent Q in the formula I represent the grouping



wherein

R_3 and R_4 independently of one another represent hydrogen, methyl or phenyl,

Z_1 represents an aliphatic radical having at least 2 carbon atoms, or a cycloaliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical, in which the carbonamide groups and carboxyl groups are bound to different carbon atoms, and the carboxyl groups, if Z_1 represents a cyclic radical and at least one of *m* and *n* represents the number 2, are each in the ortho-position with respect to a carbonamide group, or —Q—Y—Q—represents the grouping



wherein R_3 and R_4 independently of one another represent hydrogen, methyl or phenyl.

4,111,772

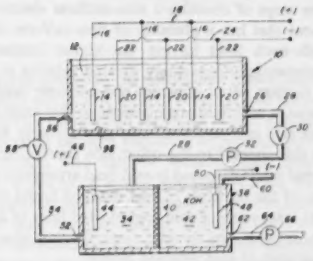
PROCESS FOR ELECTRODIALYTICALLY CONTROLLING THE ALKALI METAL IONS IN A METAL PLATING PROCESS

Richard E. Horn, Pittsburgh, Pa., assignor to Pitt Metals and Chemicals, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 579,947, May 22, 1975. This application Aug. 20, 1976, Ser. No. 716,225

Int. Cl.² B01D *13/02;* **C25D** *3/30*

U.S. Cl. 204—180 P **22 Claims**



1. A process for controlling the alkali metal ions in an electrochemical tin-plating process comprising,

withdrawing a solution from said tin-plating process, said solution containing an excess of alkali metal ions and a tin compound,

introducing said solution into a compartment of an electrodialytic cell,

removing from said solution by electrodialysis without changing the composition of the tin compound a portion of the alkali metal ions that is in excess of the alkali metal ions necessary to maintain the tin compound in solution, and

returning said solution with said portion of said alkali metal ions removed therefrom to said tin-plating process.

4,111,773

ELECTROSTATIC METHOD AND APPARATUS FOR TREATING MATERIAL

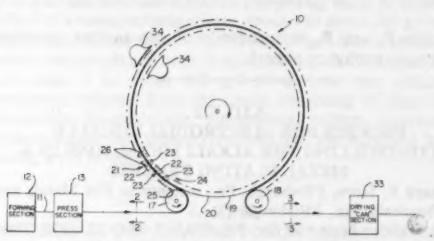
James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429

Continuation-in-part of Ser. No. 732,646, Oct. 15, 1976, Pat. No. 4,081,342, which is a continuation-in-part of Ser. No. 695,068, Jun. 11, 1976, Pat. No. 4,033,841, which is a continuation-in-part of Ser. No. 569,815, Apr. 21, 1975, Pat. No. 3,966,575, which is a continuation-in-part of Ser. No. 499,178, Aug. 21, 1974, Pat. No. 3,893,898, which is a continuation-in-part of Ser. No. 383,255, Jul. 27, 1973, Pat. No. 3,849,275, which is a division of Ser. No. 263,605, Jun. 16, 1972, Pat. No. 3,795,605, which is a continuation-in-part of Ser. No. 53,402, Jul. 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 25,938, Apr. 6, 1970, Pat. No. 3,687,834, which is a continuation-in-part of Ser. No. 864,851, Oct. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 811,421, Mar. 28, 1969, abandoned, Ser. No. 548,666, Feb. 10, 1975, Pat. No. 3,965,581, which is a continuation-in-part of Ser. No. 469,820, May 14, 1974, Pat. No. 3,931,682, and a continuation-in-part of Ser. No. 405,023, Oct. 10, 1973, Pat. No. 4,060,449, and Ser. No. 499,178, Aug. 21, 1974, Pat. No. 3,893,898. This application Dec. 23, 1977, Ser. No. 863,910

The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—180 R **10 Claims**



1. In a method of treating retained liquid in liquid bearing material of the liquid absorbing type, the improvement comprising the steps of creating a non-uniform electrostatic field arrangement that has a plurality of non-uniform electrostatic fields with each field having the higher intensity portion thereof substantially oppositely located relative to the higher intensity portion of an adjacent non-uniform field, disposing said material in said field arrangement so that angled field lines of force of said non-uniform fields pass through said material from one side thereof to the other side thereof, and vibrating said material while disposed in said field arrangement so that at least some of the particles of said retained liquid will oscillate through at least some of said angled field lines of force of said non-uniform fields and thereby cause heating of at least some of said particles of said retained liquid.

4,111,774

ELECTROFILTRATION OF ANIMAL FATS

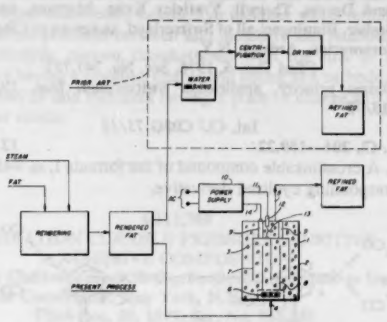
Joel Victor Landis, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 11, 1977, Ser. No. 768,002

Int. Cl.[2] B03C *5/00*

U.S. Cl. 204—186 **8 Claims**

1. The process of treating rendered animal fat to remove finely divided solids and nonglyceride extractives with essentially no hydrolysis of the fat, comprising passing said rendered animal fat in liquid form through a bed of dielectric particulate solids interposed within a d.c. electric field, whereby a refined



fat having an improved color and essentially the same fatty acid content as the starting fat is obtained.

4,111,775

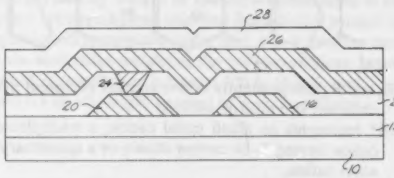
MULTILEVEL METALLIZATION METHOD FOR FABRICATING A METAL OXIDE SEMICONDUCTOR DEVICE

Ben R. Hollis, Jr.; William R. Feltner, both of Huntsville, Ala.; David L. Bouldin, Morrison, Tenn., and Donald E. Routh, Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 8, 1977, Ser. No. 814,005

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 C **9 Claims**



1. A method of fabricating a metal oxide semiconductor device having a plurality of metal layers comprising the steps of:

(a) providing a silicon substrate body and forming a thermal layer of silicon dioxide on said substrate;

(b) depositing a conductive layer of metal on the said thermal silicon dioxide layer by D.C. magnetron sputtering at a low power setting of less than 1.5 kilowatts to produce a substrate temperature of below 70° C. during deposition;

(c) depositing an insulation layer of dielectric material over said metal layer;

(d) depositing a layer of metal on said layer of dielectric material by repeating step (b);

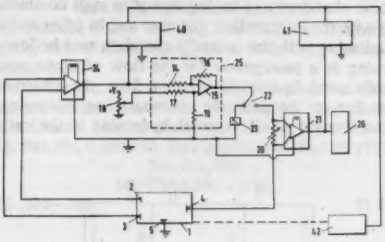
(e) repeating steps (c) and (d) until a desired number of metal layers is formed; and

(f) forming a layer of insulating oxide over the last of said metal layers.

4,111,776
ANALYTICAL APPARATUS AND PROCESSES

John Rickard Mansfield, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jun. 15, 1976, Ser. No. 696,413
Claims priority, application United Kingdom, Jun. 23, 1975, 26559/75
Int. Cl.[2] G01N 27/44
U.S. Cl. 204—195 T 5 Claims



1. Apparatus for the coulometric determination of a material present in successive samples which are introduced into the same batch of an electrolyte which is held in a coulometric cell, which cell comprises a generator electrode, which generator electrode generates a species which consumes the material and is located in the electrolyte, and a second electrode from which species generated do not reach the generator electrode, which apparatus comprises means to sense the presence of the material as a sensing signal and means to pass a sufficient quantity of electricity between the generator electrode and said second electrode to maintain or restore the sensing signal at or to its value when none of the material to be determined is present, said means to sense including a sensor electrode and a reference electrode, means to change the electrolyte in the coulometric cell in response to values of the sensing signal falling outside a predetermined limit, and control means for controlling said means to change including:

(a) a differential to potential signal convertor having a high input impedance;

(b) means for feeding (a) with a sensing signal which varies as the potential difference between the sensor and reference electrodes;

(c) a differential potential input amplifier fed by (a) and by means for setting the output current of (c) to zero at a desired value of the sensing signal by feeding a suitable off-set potential to (c), the whole apparatus excluding the coulometric cell having a phase shift of less than 90° with the input signals received;

(d) a comparator for comparing a potential signal produced by (a) with a pre-set potential; and

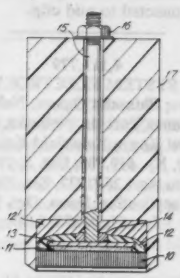
(e) means in response to a signal from (d) indicating a potential signal from (a) in excess of that pre-set to operate means for changing the electrolyte in the coulometric cell.

4,111,777
ION-SENSITIVE ELECTRODES

John Vincent Dobson, Hartlepool, and Thomas Dickinson, Newcastle-upon-Tyne, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 605,881, Aug. 19, 1975, abandoned.
This application Nov. 12, 1976, Ser. No. 741,494
Claims priority, application United Kingdom, Sep. 4, 1974, 38748/74
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 M 7 Claims

1. An ion-sensitive electrode for determining the concentration of selected monovalent cations in an electrolyte, comprising a first member, which includes a β-alumina, for contacting an electrolyte, a second member in contact with the first member and comprising a tungsten bronze, means for making electrical contact with the tungsten bronze, and insulating means distinct from the first member constructed to form a container shielding the second member and the contact means from an electrolyte when the electrode is in operation, both the β-



alumina and the said tungsten bronze containing cations selected from the group consisting of Na, K, Rb, Li, Tl, Ag, Cu, NO, Cs and NH_4 allowing the electrode to be used for determining the concentration of said cations in an electrolyte.

4,111,778
PROTECTION ASSEMBLY AND GROUND FOR GAS CONSTITUENT SENSOR

Donald Colen Davis, Fostoria; Alan H. Bilger, Tiffin, and Kent Christ Madson, Jr., Kansas, all of Ohio, assignors to Bendix Autolite Corporation, Fostoria, Ohio

Filed Dec. 5, 1977, Ser. No. 857,333
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 S 16 Claims

1. An electrochemical gas constituent sensor assembly comprising a solid electrolyte sensing element, said sensing element being generally cup-shaped having a closed end and an open end, said sensing element including an interior surface and an exterior surface, said exterior surface being adapted to be exposed to a gas to be sensed and said interior surface being adapted to be exposed to a reference gas, sleeve means forming a cavity in fluid communication with said open end and said interior surface, said sleeve means including aperture means in the wall thereof for communicating the reference gas outside said cavity to the inside of said cavity, and mask means wholly positioned intermediate the ends of said sleeve means for at least partially masking said aperture for substantially precluding the entry of contaminants into said cavity through said aperture.

12. An electrochemical gas constituent sensor assembly comprising a solid electrolyte sensing element, having an interior surface and an exterior surface, said exterior surface being adapted to be exposed to a gas to be sensed and said interior surface being adapted to be exposed to a reference gas, sleeve means forming a cavity in fluid communication with said open end and said interior surface, said sleeve means including aper-

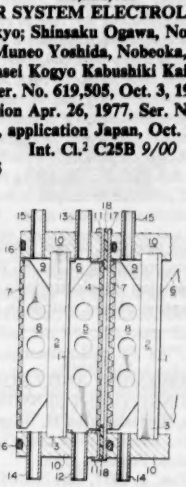
ture means in the wall thereof for communicating the reference gas outside said cavity to the inside of said cavity, and metallic ground means including a clip positioned on said sleeve means intermediate the ends thereof and in electrical contact therewith, said ground means including a conductor mechanically and electrically connected to said clip.

4,111,779

BIPOLAR SYSTEM ELECTROLYTIC CELL

Maomi Seko, Tokyo; Shinsaku Ogawa, Nobeoka; Nobuo Ajiki, Nobeoka, and Muneo Yoshida, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 619,505, Oct. 3, 1975, abandoned. This application Apr. 26, 1977, Ser. No. 790,924
Claims priority, application Japan, Oct. 9, 1974, 49-116695
Int. Cl.[2] C25B 9/00
U.S. Cl. 204—255 8 Claims



1. An electrolyzer comprising a plurality of bipolar system unit cells disposed alternately with cation exchange membranes therebetween, each unit cell comprising a partition wall consisting of an explosion-bonded titanium plate and iron plate which partitions said cell into an anode chamber and a cathode chamber, an anode which is a titanium substrate coated with platinum group metal oxides, the said anode being electrically connected to the titanium of said partition wall and an iron cathode electrically connected to the iron of said partition wall; there being an interval of at least 10 mm between the cathode and the partition wall.

4,111,780

APPARATUS AND PROCESS FOR THE ELECTROLYTIC TREATMENT OF ALKALI METAL HALIDE SOLUTION WITH ION EXCHANGE MEMBRANES

Naohiro Murayama; Makoto Fukuda; Teruo Sakagami; Shirou Suzuki; Yoshikazu Kokubu, and Toshio Enoki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1976, Ser. No. 743,294
Claims priority, application Japan, Nov. 19, 1975, 50-139074
Int. Cl.[2] C25B 1/16, 1/26, 9/00
U.S. Cl. 204—266 15 Claims

1. An apparatus for the electrolytic treatment of an aqueous alkali metal halide solution comprising:

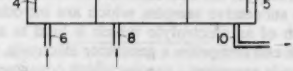
(a) an electrolytic bath assembly consisting of an anodic chamber, an intermediate chamber, and a cathodic chamber arranged in series;

(b) said anodic chamber being provided with an anode, inlet means for introducing concentrated aqueous alkali metal halide solution into said anodic chamber, and outlet means for discharging dilute aqueous alkali metal halide solution from said anodic chamber;

(c) said intermediate chamber being provided with inlet means for introducing water or dilute aqueous alkali metal hydroxide solution, wherein the alkali metal is the same as the alkali metal of the halide specified in part (b) above, into said intermediate chamber;

(d) said cathodic chamber being provided with a cathode and outlet means for discharging concentrated aqueous alkali metal hydroxide solution from said cathodic chamber;

(e) means for adjusting and maintaining the concentration of formed dilute aqueous alkali metal hydroxide in said intermediate chamber to a desired level comprising a hollow pipe positioned externally of said intermediate and cathodic chambers and having one of its ends communicating with the intermediate chamber and its other end communicating with the cathodic chamber, said hollow pipe serving as a passageway for the flow of dilute aqueous alkali metal hydroxide solution from the intermediate chamber to the cathodic chamber thus increasing the concentration of alkali metal hydroxide in the cathodic



chamber any excess of which may be removed through the outlet means in said cathodic chamber to adjust and maintain the concentration of the alkali metal hydroxide in said cathodic chamber to a desired level;

(f) a first anodic ion exchange membrane separating the anodic chamber from the intermediate chamber, said first membrane being durable to aqueous alkali metal hydroxide solution and gaseous chlorine and having a current efficiency exceeding about 80%; and

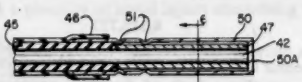
(g) a second anodic ion exchange membrane separating the intermediate chamber from the cathodic chamber, said second membrane being durable to aqueous alkali metal hydroxide solution, having a low electrical resistance in aqueous alkali metal hydroxide solution, having high selective penetration performance to alkali metal ions, and having moderate water and hydroxyl ion penetration performance.

4,111,781

DANGLER ASSEMBLY FOR ELECTRO-CHEMICAL APPARATUS

Noel Edward Smith, and Christopher Joseph Smith, both of 1099 Tillinghast Rd., East Greenwich, R.I. 02818

Filed Nov. 14, 1977, Ser. No. 851,117
Int. Cl.[2] C25D 17/20, 17/10, 17/12
U.S. Cl. 204—280 3 Claims



1. A dangler assembly for an electro-chemical apparatus comprising:

(a) a cathode core,

(b) insulation encasing said cathode core,

(c) insulation covering encasing said insulation,

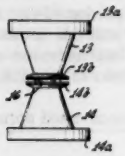
(d) said cathode core extending beyond said insulation to provide an exposed end,

(e) a tube of electrical conductive material,

(f) means fastening said tube to said cathode core,

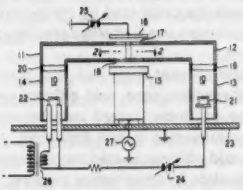
(g) a contactor comprising a casing having one open end, and a wall closing one end,
(h) said contactor located over said tube with said open end located between said insulation and said insulation covering,
(i) and means removably fastening said contactor with said tube in electrically conductive relationship.

4,111,782
SPUTTERING APPARATUS
Alan S. Penfold, Playa del Rey, and John A. Thornton, Los Angeles, both of Calif., assignors to Telic Corporation, Santa Monica, Calif.
Division of Ser. No. 535,429, Dec. 23, 1974, Pat. No. 4,041,353, which is a continuation of Ser. No. 254,504, May 18, 1972, abandoned, and a continuation-in-part of Ser. No. 178,240, Sep. 7, 1971, Pat. No. 3,884,793. This application May 31, 1977, Ser. No. 801,766
Int. Cl.² C23C 15/00
U.S. Cl. 204—298 11 Claims



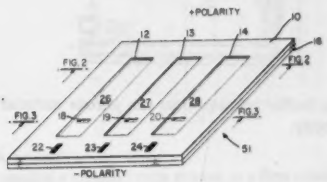
1. Sputtering apparatus, comprising:
a pair of electrodes separated by an insulator, said electrodes being positioned end to end in a coaxial post-type configuration having outwardly extending wings at remote opposite distal ends and at the inner proximal ends of said electrodes, said wings at said inner ends being of smaller diameter than said wings at said outer ends;
mounting means for supporting said electrodes in close, spaced apart relationship in a low pressure working gas environment;
power supply means for supplying an electrical voltage across said pair of electrodes; and
magnetic field means for forming a magnetic field which defines with said electrodes at least one completely closed trap for containing substantially all electrons emitted from said electrodes and having sufficient energy to further ionize said working gas.

4,111,783
TRIODE SPUTTERING SYSTEM
Jeffrey Bruce Bindell, Allentown; Lowell Henry Holschwandner, Fountain Hill; Edward Franklin Labuda, Allentown, and William Dennis Ryden, Whitehall, all of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Nov. 8, 1977, Ser. No. 849,600
Int. Cl.² C23C 15/00
U.S. Cl. 204—298 3 Claims



1. A triode sputtering apparatus for reducing contamination from unwanted sputtering of the apparatus comprising a confining tube including an anode support portion, a cathode support portion and a plasma support portion,
characterized in that said confining tube comprises at least two electrically isolated portions.

4,111,784
APPARATUS FOR ELECTROPHORESIS
Harald Dahms, 22 Lakeview Rd., Ossining, N.Y. 10562
Continuation of Ser. No. 658,372, Feb. 17, 1976, abandoned, which is a continuation of Ser. No. 566,245, Apr. 19, 1975, abandoned, which is a continuation of Ser. No. 392,652, Aug. 29, 1973, abandoned, which is a continuation of Ser. No. 122,310, Mar. 9, 1971, abandoned. This application May 18, 1977, Ser. No. 797,903
Int. Cl.² G01N 27/26, 27/28
U.S. Cl. 204—299 EC 25 Claims

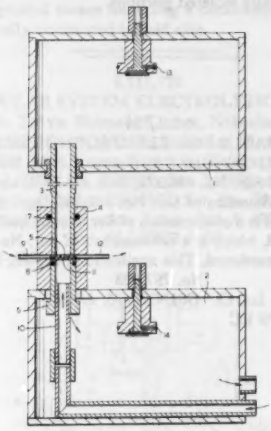


1. A plate for performing electrophoretic separations, said plate comprising:
a thin flexible membrane that is substantially transparent to ultraviolet radiation, said membrane being at least partially coated with an electrophoretic medium, and
a support member supporting said membrane, there being at least one opening in said support member sufficiently large to allow electrophoretic separations and scanning by ultraviolet radiation of said electrophoretic medium to go unimpeded by said support member.

4,111,785
APPARATUS FOR PREPARATIVE ELECTROPHORESIS
Willem Gerrit Roskam, 55 Rue Lacordaire, 75015 Paris, France
Filed May 16, 1977, Ser. No. 797,286
Claims priority, application Netherlands, May 18, 1976, 7605315
Int. Cl.² G01N 27/26, 27/28
U.S. Cl. 204—299 R 23 Claims

1. Electrophoresis apparatus, comprising a tubular member having first and second ends for receiving a column of gel, means defining an elution chamber at the first end of the tubular member, primary inlet duct means for passing buffer solution into the elution chamber, and outlet duct means for discharging buffer solution from the elution chamber and so disposed with respect to the primary inlet duct means that buffer solution passes from the primary inlet duct means to the outlet duct means substantially perpendicular to the central axis of the tubular member, the chamber-defining means comprising a plate-form body of solid but porous material having two main surfaces extending substantially perpendicular to the central axis of said tubular member, and the apparatus also comprising auxiliary inlet duct means for passing an auxiliary flow of buffer solution into the elution chamber through that main surface of the plate-form body which is further from the second end of the tubular member, and a layer of porous mate-

rial between the elution chamber and the auxiliary inlet duct means, the porous material of said layer having a higher flow



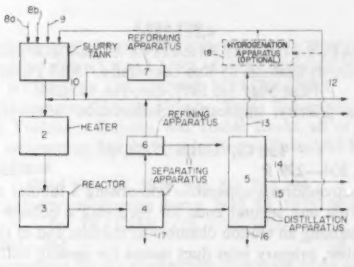
resistance to buffer solution than the porous material of the plate-form body.

4,111,786

PROCESS FOR LIQUEFYING COAL

Hidehiko Sugimura; Hisashi Murakami, both of Tokyo; Toshikatsu Ohtsubo, and Kenji Fukuda, both of Omuta, all of Japan, assignors to Mitsui Coke Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1976, Ser. No. 671,022
Claims priority, application Japan, Apr. 16, 1975, 45-332
Int. Cl.[2] C10G *1/04;* C10B *55/00*
U.S. Cl. 208—8 **12 Claims**



1. In a process for manufacturing reformed coal which comprises the steps of (a) forming a slurry of coal in an oil; (b) subjecting the coal and oil slurry to hydrogenation conditions sufficient to depolymerize the coal; (c) separating a substantially liquified coal solution from the product of said hydrogenation; and (d) distilling said liquified coal solution at distillation conditions sufficient for distilling a heavy oil distillate therefrom and for recovering a reformed coal as a distillation bottoms product the improvement which comprises said slurry forming step (a) which includes the step of forming a mixed oil by adding an amount of 1 to 10 parts by weight of a coal oil having a boiling point higher than about 150° C to one part by weight of a petroleum oil which is a heavy fuel oil.

4,111,787

STAGED HYDROCONVERSION OF AN OIL-COAL MIXTURE

Clyde L. Aldridge, and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 702,271, Jul. 2, 1976. This application Dec. 8, 1977, Ser. No. 858,546
Int. Cl.[2] C10G *1/08*
U.S. Cl. 208—10 **17 Claims**

1. A staged process for hydroconverting a non-hydrogen donor heavy hydrocarbon oil and coal, which comprises:

(a) adding to said heavy oil an oil soluble metal compound of a metal selected from the group consisting of Groups IVB, VB, VIB, VIIB and VIII of the Periodic Table of Elements and mixtures thereof;

(b) converting said oil soluble metal compound to a catalyst within said oil in the presence of a hydrogen-containing gas by heating said oil to an elevated temperature;

(c) reacting the oil containing said catalyst with hydrogen under oil hydroconversion conditions in a first hydroconversion zone;

(d) passing at least a portion of said first hydroconversion zone effluent to at least one additional hydroconversion zone maintained at coal hydroconversion conditions;

(e) introducing coal into said additional hydroconversion zone, and

(f) recovering a hydroconverted normally liquid hydrocarbon product.

4,111,788

STAGED HYDROGENATION OF LOW RANK COAL

Michael C. Chervenak, Pennington, and Edwin S. Johanson, Princeton, both of N.J., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Sep. 23, 1976, Ser. No. 725,854
Int. Cl.[2] C10G *1/08*
U.S. Cl. 208—10 **21 Claims**

1. A two-stage process for the hydrogenation of low rank coal to produce hydrocarbon liquids and gaseous products, which comprises:

blending particulate low rank coal with a slurrying oil to form a pumpable coal-oil slurry,

partially hydrogenating said coal by contacting said coil-oil slurry with hydrogen in a first stage reaction zone containing no catalyst,

passing the entire effluent from said first zone to a second ebullated bed reaction zone, said effluent comprising the hydrogenation products formed and the coal which was only partially converted in said first zone,

hydrogenating said effluent in said second zone in the presence of particulate hydrogenation catalyst, the temperature in said second zone being at least 25° F. less than the temperature in said second zone, and

withdrawing a gaseous effluent stream and a liquid effluent stream from said second stage reaction zone.

4,111,789

RECOVERY OF HYDROCARBON FROM DILUTION CENTRIFUGING TAILINGS

Kenneth Porteous; Leigh Falkenberg, both of Edmonton, and Stephen Lane, Sherwood Park, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa; Her Majesty the Queen in right of the Province of Alberta, Department of, Education Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; Ontario Energy Corporation; Imperial Oil Limited, both of Toronto; Canada-Cities Service, Ltd., Calgary and Gulf Oil Canada Limited, Toronto, all of Canada

Filed Feb. 14, 1977, Ser. No. 768,545
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—11 LE 6 Claims

1. A method for treating tailings from the dilution centrifuging circuit of a hot water extraction operation for the recovery of bitumen from oil sands, said tailings containing bitumen, hydrocarbon diluent, solids and water, comprising:

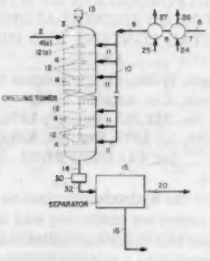
introducing the tailings into a flotation cell and retaining it therein for a sufficient period of time, while subjecting it to agitation and flotation using gas introduced into the base of the body of tailings, to recover a significant portion of the contained bitumen and diluent as froth and reject a portion of the solids and water as under flow; and removing the froth for further threatment.

4,111,790

DILUTION CHILLING DEWAXING SOLVENT

Theodore H. West, Sarnia, Canada, assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Oct. 28, 1976, Ser. No. 736,514
Int. Cl.[2] C10G *43/08*
U.S. Cl. 208—33 9 Claims



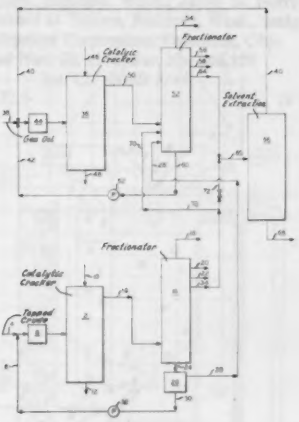
1. In a process for dewaxing a waxy petroleum oil stock comprising introducing said waxy oil stock into an elongated chilling zone divided into a plurality of stages and passing said waxy oil from stage to stage of said zone while injecting cold dewaxing solvent into at least a portion of said stages and maintaining a high degree of agitation in a plurality of solvent-containing stages so as to achieve substantially instantaneous mixing of said waxy oil and said solvent-waxy oil mixture as it progresses from stage to stage through said chilling zone, thereby precipitating at least a portion of said wax from said oil under conditions of said high degree of agitation separating the precipitated wax from the solvent-oil mixture and recovering an oil stock of reduced wax content from said mixture, the improvement which comprises using as said cold dewaxing solvent, a solvent selected from the group consisting of mixtures of (a) methylene chloride and (b) acetone, MEK, methanol and mixtures thereof and wherein the amount of methylene chloride in said dewaxing solvent is at least about 20 LV %.

4,111,791

PRODUCTION OF HIGHLY AROMATIC EXTRACT OIL

Edgar D. Davis, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 24, 1977, Ser. No. 771,712
Int. Cl.[2] C10G *37/02*
U.S. Cl. 208—78 9 Claims



1. A process comprising

(a) passing a topped crude stream to a first catalytic cracking zone wherein said stream is subjected to catalytic cracking to produce an effluent of cracked products;

(b) passing the effluent obtained in step (a) to a first fractionation zone wherein the cracked products from the first catalytic cracking zone are separated into separate distillate fractions comprising light hydrocarbons, gasoline, light cycle oil, heavy cycle oil and a catalyst-containing bottoms product;

(c) passing a substantial portion of said heavy cycle oil obtained in step (b) to a second fractionation zone;

(d) passing a gas oil stream to a second catalytic cracking zone wherein said gas oil stream is subjected to catalytic cracking to produce an effluent of cracked products;

(e) passing the effluent obtained in step (d) to said second fractionation zone wherein the cracked products from the second catalytic cracking zone and the heavy cycle oil from step (b) are separated into separate distillate fractions comprising light hydrocarbons, gasoline, light cycle oil, heavy cycle oil and a catalyst-containing bottoms product; and

(f) passing said heavy cycle oil obtained in step (e) to a solvent extraction zone wherein the oil is separated into an aromatics-containing extract phase and into a paraffin-containing raffinate phase.

4,111,792

COMBINATION PROCESS FOR UPGRADING SYNTHOL NAPHTHA FRACTIONS

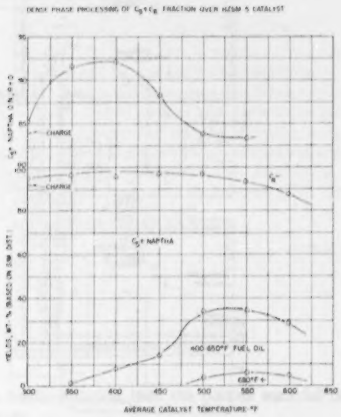
Philip D. Caesar, Princeton; William E. Garwood, Haddonfield; William F. Krudewig, Riverton, all of N.J., and John J. Wise, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 732,235, Oct. 14, 1976. This application Feb. 11, 1977, Ser. No. 767,876
Int. Cl.[2] C07C *15/02*; C10G *37/02*
U.S. Cl. 208—79 10 Claims

1. A method for upgrading the C_5+ liquid product of a Fischer-Tropsch synthesis having an end-point from about 340° to 400° F which comprises:

(a) fractionating said liquid product to separate a $C_5 + C_6$ fraction and a C_7+ fraction;

(b) reforming the C_7+ fraction to produce a C_5+ reformate;
(c) containing the $C_5 + C_6$ fraction in the absence of added hydrogen with a crystalline aluminosilicate characterized by a pore dimension greater than about 5 Angstroms, a silica to alumina ratio of at least 12, a constraint index within the range of 1 to 12 at dense phase process conditions of a temperature of about 325° to 500° F, a pressure



of about 200 to 1000 psig, and a LHSV of about 0.1 to 5.0; and
(d) recovering a C_5 gasoline product boiling up to about 400° F having an enhanced octane value from the dense phase processed $C_5 + C_6$ fraction; and
(e) blending said C_5+ reformate with said C_5 gasoline product.

4,111,793
OLEFINS PRODUCTION

Alexander John Kolombos, Sutton; Donald McNeice, Reigate, and Dennis Charles Wood, Sunbury, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Sep. 13, 1976, Ser. No. 722,552
Claims priority, application United Kingdom, Sep. 25, 1975, 39284/75
Int. Cl.² C07C *3/20*; C10G *11/04*
U.S. Cl. 208—121 **10 Claims**

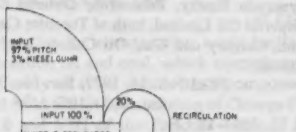
1. A process of producing olefins by cracking at elevated temperature in the presence of steam a hydrocarbon feedstock consisting essentially of wax distillate and boiling between 300° and 550° C over a catalyst composition consisting essentially of a manganese oxide and zirconia or titania.

4,111,794
METHOD OF PRODUCING PITCH COKE

Gerhard Pietzka, Vockenhausen, and Harald Tillmanns, Kelkheim, both of Germany, assignors to Sigri Elektrographit GmbH, Meitingen bei Augsburg, Germany

Filed Mar. 31, 1977, Ser. No. 783,029
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614448
Int. Cl.² G10G *9/14*
U.S. Cl. 208—131 **5 Claims**

1. Method for the manufacture of pitch coke with needle-like structure which comprises:
(a) mixing pyrolysis oil condensate formed in the coking of coal-tar pitch with a coal-tar pitch having a softening point between 70° and 150° C. in the proportion of 70 to 95% by weight coal-tar pitch and 5 to 30% by weight pyrolysis oil condensate,
(b) filtering said mixture of condensate and pitch at a temperature 100° C. to 200° above the softening point of the pitch,
(c) passing the filtrate in a restricted stream through a heating zone and heating the filtrate therein to a temperature between about 450° and 525° C.,
(d) discharging the thus heated filtrate to a coking chamber wherein the heated filtrate forms a non-volatile carbonaceous residue as coke and volatile vapor and gas,



(e) releasing the volatile vapor and gas from the coking chamber and passing the vapor and gas to a fractionating zone with an overhead temperature of between about 150° and 200° C. at pressures of about 0.5 to 2.0 bar and a bottom temperature of about 300° C., in which the vapor is condensed to form pyrolysis oil condensate,
(f) withdrawing said condensate from the fractioning zone, and returning at least a part of said condensate for mixing with additional incoming coal-tar pitch prior to said filtering.

4,111,795
HYDRODESULFURIZATION OF HYDROCARBON WITH COBALT-MOLYBDENUM-ALUMINA CATALYST OF HIGH METAL CONTENT AND HIGH SURFACE AREA

Howard D. Simpson, Irvine, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 751,383, Dec. 17, 1976. This application Nov. 10, 1977, Ser. No. 850,409
Int. Cl.² C10G *23/02*
U.S. Cl. 208—216 **7 Claims**

1. A process for the hydrodesulfurization of a hydrocarbon feedstock which comprises contacting said feedstock in admixture with hydrogen and under hydrodesulfurization conditions with a catalyst comprising a sulfided composite of about 18–30 weight-percent of MoO_3 and about 4–12 weight-percent CoO supported on an alumina base, said catalyst having been prepared by the steps of:
(1) comulling boehmite alumina with sufficient of an aqueous ammonium molybdate solution to provide the desired MoO_3 content in the finished catalyst;
(2) drying the composite from step (1) at temperatures below about 500° F. to a water content of between about 20 and 40 weight-percent;
(3) intimately admixing the dried composite from step (2) with a water-soluble cobalt salt and sufficient water to provide an extrudable paste;
(4) extruding the paste into extrudates having a diameter between about 1/20 and ¼ inch; and
(5) calcining the extrudates at a temperature which is (a) between about 900° and 1250° F. and (b) correlated with the MoO_3 content of said catalyst so as to give a final surface area of at least $M/0.14$ m^2/g, where M is the weight-percent of MoO_3 in said catalyst.

4,111,796
METHOD FOR PRESULFIDING HYDRODESULFURIZATION CATALYSTS

Stephen J. Yanik, Valencia; Angelo A. Montagna, Monroeville, and James A. Frayer, Pittsburgh, all of Pa., assignors to Gulf Research & Development Co., Pittsburgh, Pa.

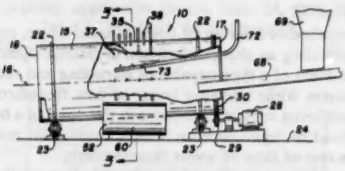
Filed Apr. 2, 1976, Ser. No. 673,075
Int. Cl.[2] C10G 23/02; B01J 27/02
U.S. Cl. 208—216 6 Claims

1. A process which comprises contacting a catalyst consisting essentially of Group VI-B and Group VIII hydrogenation components on a refractory oxide support with a sulfiding agent selected from the group consisting of C_1 - C_{20} mercaptans, dimethyl sulfide, carbon disulfide and other organic sulfides containing from 1 to 20 carbon atoms per molecule dispersed in a petroleum oil stock which is a liquid under the hereafter described presulfiding conditions, said contacting being conducted in a nitrogen atmosphere substantially free of oxygen and hydrogen and at a presulfiding temperature in the range of 200° to 450° F. and at a presulfiding pressure in the range of atmospheric to 400 psig, maintaining the contact between said sulfiding agent and said catalyst until the total amount of the sulfur in said sulfiding agent brought into contact with said catalyst is in the range of 10 to 55 weight percent of the amount of sulfur required to completely sulfide the metals on the catalyst at the contact temperature and pressure, and thereafter contacting said catalyst with a sulfur-containing hydrocarbon feed under hydrodesulfurization conditions.

4,111,797
METHOD AND APPARATUS FOR SEPARATING PARTICULATE MATERIALS OF DIFFERENT SPECIFIC GRAVITIES

Marvin J. Richter, Box 8, R.R. #2 West Coast Rd., Sooke, B.C., Canada (VOS INO)

Filed Dec. 15, 1976, Ser. No. 750,707
Int. Cl.[2] B03B 5/48; C22B 11/12
U.S. Cl. 209—14 15 Claims



1. Apparatus for separating particulate materials of different specific gravities, comprising

an inclined drum mounted for rotation around a longitudinal axis and having an intake end and a discharge end,

means for directing said particulate materials and water into the drum through the intake end thereof,

an annular wall section in the drum having a plurality of perforations therein and spaced from each other, relatively small particles of said materials passing through the perforations during rotation of the drum,

hollow spigots connected to the drum and registering with said perforations and radiating therefrom, each spigot having an open side facing in the direction opposite to the direction in which the drum rotates,

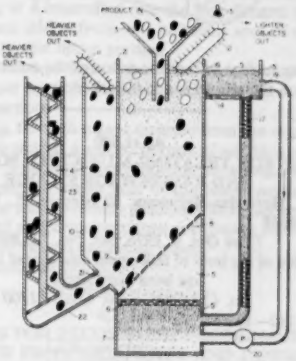
an open concentrate bin beneath said wall section of the drum to receive the particles from the spigots in a bed of materials, the material particles tending to separate during movement through the spigots,

said spigots being long enough to reach into the bed of particles to discharge the particles moving through the spigots into the bed and agitating said bed during movement therethrough, and said water traveling through the spigots and overflowing from the bin and removing therewith lighter particles while heavier particles concentrate towards the bottom of the bin.

4,111,798
SEPARATION OF SOLIDS BY VARYING THE BULK DENSITY OF A FLUID SEPARATING MEDIUM

Palmer L. Peterson, Richland, Wash.; James B. Duffy, Brea, Calif., and Richard D. Tokarz, Richland, Wash., assignors to Battelle Development Corporation, Columbus, Ohio

Filed Nov. 30, 1976, Ser. No. 746,109
Int. Cl.[2] B03B 5/44
U.S. Cl. 209—172.5 18 Claims



1. A method for separating objects having a density greater than a selected density value from objects having a density less than said selected density value, comprising:

(a) providing a separation vessel having an upper and lower portion, said vessel containing a liquid having a density exceeding said selected density value;

(b) reducing the apparent density of the liquid to said selected density value by introducing solid, bubble-like bodies having a density less than that of the liquid into the lower portion of the vessel and permitting them to rise therethrough;

(c) introducing the objects to be separated into the separation vessel and permitting the objects having a density greater than the apparent density of the liquid to sink to the lower portion of the vessel, while the objects having a density less than said selected density value float in the upper portion of the vessel; and

(d) separately removing the higher density objects in the lower portion and the lower density objects in the upper portion from the separation vessel.

4,111,799
STOCK SCREEN FOIL

Vincent W. Cancilla, Pittsfield, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Jul. 7, 1977, Ser. No. 813,700
Int. Cl.[2] B03B 5/56
U.S. Cl. 209—273 9 Claims

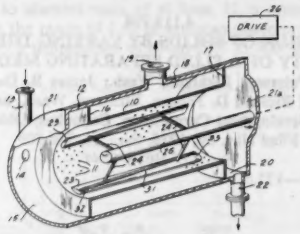
3. A mechanism for screening a stock slurry for a paper making machine comprising in combination:

a perforate screen to which stock is supplied to a surface of the screen with a portion of the stock passing through the screen and a portion not passing the screen and flowing in a discharge direction;

a foil movable along said surface of the screen having an outer surface facing the screen for creating a pressure pulsation in the screen to aid in the passage of stock therethrough and having an inwardly facing surface away from the screen;

and a vane means on the foil extending in a direction for

generating movement of the stock along said surface in a discharge direction and being soley on said inwardly facing surface so that the action of the outer surface of the foil on the screen is not disturbed.



4,111,800

PROCESS FOR TREATING MUNICIPAL SOLID WASTE AND RAW SEWAGE SLUDGE

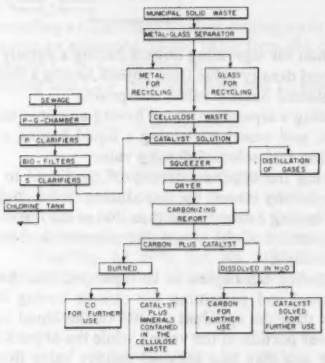
Alfred J. Harendza-Harinxma, 50 Merion Pl., Lawrenceville, N.J. 08648

Filed Oct. 6, 1976, Ser. No. 729,890

The portion of the term of this patent subsequent to Jun. 1, 1993, has been disclaimed.

Int. Cl.[2] C02C *3/00*; C01B *31/00*

U.S. Cl. 210—10 **14 Claims**



1. A method of carbonizing cellulose-containing waste material and sewage sludge, which comprises:

combining sewage sludge containing from 4% to 7% solids with an alkali metal meta aluminate of a concentration ranging from 1% to 20% by weight based on said sewage sludge;

combining the cellulose-containing waste material with the sludge-aluminate mixture; and then

heating said carbonizing mixture to carbonize at least the cellulose-containing waste material in a closed system at a temperature ranging from 175° C. to 700° C.

10. A process for treating both cellulose-containing municipal solid waste and municipal/industrial sewage, which comprises:

a. chopping-up the solids in said sewage in a screening chamber to reduce the size of the solids;

b. removing any sand, grit or abrasive present in the chopped-up sewage in a Parshall flume and grit chamber;

c. flowing the sewage from the Parshall and grit chamber in a primary clarifier to remove solids and greases in the sewage by settling;

d. flowing the effluent from the primary clarifier into bio-filter and later into a secondary clarifier to remove by settling substantially all remaining solids;

e. filtering the effluent from the secondary clarifier in a carbon filter;

f. killing any bacteria in the effluent by contacting the same with liquid chlorine, or the like;

g. adding a water soluble alkali metal meta aluminate to said remaining solids to obtain a concentration ranging from 1% to 20% by weight based on said sewage sludge;

h. placing the cellulose-containing municipal solid waste in a screened basket;

i. dipping said basket into the sewage-aluminate mixture to intimately contact and soak the waste with the aluminate-sewage mixture;

j. removing the excess sewage-aluminate mixture from said basket;

k. heating the dry or partially dry mixture to carbonize the solid waste and intermixed sewage in a closed system at a temperature ranging from 175° C. to 700° C.

4,111,801

FILTRATION SYSTEM

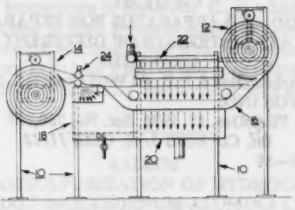
John Jay, Halifax; Gary D. Bonner, Lower Sackville, and Osmundo J. Betancourt, Halifax, all of Canada, assignors to Canplan Filtration Limited, Halifax, Canada

Continuation of Ser. No. 673,888, Apr. 5, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,468

Claims priority, application United Kingdom, Apr. 16, 1975, 15716/75

Int. Cl.[2] B01D *33/14*

U.S. Cl. 210—40 **16 Claims**



8. A method of filtering oil contaminated water, comprising:

(a) providing an elongated ribbon of flexible open cell plastics foam of a type capable of attracting and retaining oil thereon while allowing water to pass therethrough, said foam being subject to collapse in the event of a build-up of a head of liquid thereon with a consequent reduction in the rate of flow of water therethrough;

(b) supporting a section of the ribbon in a generally horizontal manner on an open grid-like support to permit free drainage therefrom, over substantially the entire area of said section of ribbon, of water passing through the plastics foam;

(c) distributing the oil contaminated water substantially uniformly and in a finely divided manner over substantially the entire area of said section of the ribbon with means to distribute contaminated liquid, comprising spray means and at least one perforate plate means positioned under and spaced from said spray means; the perforations of said perforate plate means spaced and sized to provide a gentle rain of said contaminated liquid over substantially the entire area of said section, said rain being of sufficient flow rate and distribution to eliminate collapse of the plastic foam of said section,

(d) advancing said ribbon over said support after the foam ribbon has collected a certain quantity of oil whereby to position a further section of the foam ribbon over said support; and distributing the oil contaminated water over said further section of the ribbon;

(e) applying forces to said first mentioned section of the ribbon to squeeze therefrom oil collected therein, and collecting said oil;

(f) and repeating steps (d) and (e) until the desired quantity of contaminated water has been filtered.

12. Apparatus for filtering oil contaminated liquids, particularly water, said apparatus comprising:

a. an elongated ribbon of flexible open cell plastics foam filtering material capable of attracting and retaining oily substances thereon, said flexible foam being subject to collapse in the event of a build-up of a head of liquid thereon with a consequent reduction in the rate of flow of the liquid therethrough,

b. spaced apart supply means and take-up means each adapted to store a length of said ribbon thereon with a length of said ribbon extending therebetween, said supply means and said take-up means being arranged to allow the ribbon to be advanced from the supply means to the take-up means,

c. a filter tray located intermediate the supply means and the take-up means and supporting a section of the length of ribbon of foam material in a generally horizontal position, the filter tray including a grid-like bottom to permit free drainage of liquid away from the foam ribbon over substantially the entire area of said section of the ribbon, and tray having upright side walls which inhibit by-pass of contaminated liquid around the section of the foam ribbon and sloping end walls to assist in free movement of the foam ribbon when the latter is advanced across the filter tray,

d. means to distribute contaminated liquid, comprising spray means and at least one perforate plate means positioned under and spaced from said spray means; the perforations of said perforate plate means being spaced and sized to provide a gentle rain of said contaminated liquid over substantially the entire area of said section, said rain being of sufficient flow rate and distribution to eliminate collapse of the plastic foam of said section.

4,111,802

WATER TREATMENT APPARATUS AND METHOD

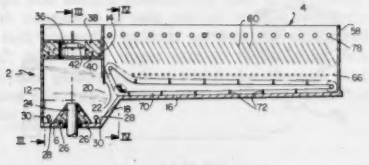
Robert Louboutin, Crespieres, France, assignor to Societe Degremont, Rueil-Malmaison, France

Filed Mar. 2, 1977, Ser. No. 773,555

Claims priority, application France, Mar. 24, 1976, 76 08442

Int. Cl.² B01D *21/16;* C02B *1/22*

U.S. Cl. 210—46 **44 Claims**



1. A liquid treatment apparatus comprising:

a single enclosure containing therein at least one reaction zone having therein sludge and at least one decanting zone, said reaction zone having a lower portion and an upper portion separated from said lower portion;

means for introducing liquid to be treated into said lower portion of said reaction zone;

means for turbulently mixing said liquid and sludge within a turbulent area of said lower portion of said reaction zone and withdrawing at a controlled rate the thus formed mixture of liquid and sludge from said turbulent area of said lower portion to said upper portion;

means for recycling a first portion of the thus withdrawn mixture from said upper portion back into said turbulent area of said lower portion;

means, separate from said recycling means, for distributing a second portion of said thus withdrawn mixture from said upper portion in a uniform manner throughout the entire area of the lower portion of said decanting zone, whereby purified liquid rises upwardly to the top of said decanting zone and sludge settles toward the bottom of said decanting zone; and

means for collecting said purified liquid.

17. A method for treating liquid in an apparatus of the type including a single enclosure containing therein at least one reaction zone having therein sludge and at least one decanting zone, said reaction zone having a lower portion and an upper portion separated from said lower portion, said method comprising:

introducing liquid to be treated into said lower portion of said reaction zone;

turbulently mixing said liuqid with said sludge in a turbulent area of said lower portion of said reaction zone and withdrawing at a controlled rate the thus formed mixture of liquid and sludge from said turbulent area of said lower portion to said upper portion;

recycling a first portion of the thus withdrawn mixture from said upper portion back into said turbulent area of said lower portion;

distributing, through means separate from the means of said step of recycling, a second portion of said thus withdrawn mixture from said upper portion in a uniform manner throughout the entire area of the lower portion of said decanting zone, whereby purified liquid rises upwardly to the top of said decanting zone and sludge settles toward the bottom of said decanting zone;

collecting said purified liquid.

4,111,803

PROCESS FOR RECOVERING PROTEINACEOUS MATTER FROM ACID WHEY AND TANNERY UNHAIRING EFFLUENTS

Robert E. Townend, Elkins Park, Pa., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 3, 1977, Ser. No. 803,191

Int. Cl.² C02B *1/20;* C02C *5/02*

U.S. Cl. 210—51 **1 Claim**

1. A process for removing and recovering proteinaceous matter from acid whey and tannery unhairing waste and reducing the biological oxygen demand of said acid whey and unhairing waste, comprising mixing aqueous acid whey and aqueous tannery unhairing waste in proportions such that the mixture contains from 20 to 25% tannery waste by volume adjusting the pH of the mixture to from 8 to 10, heating the mixture to about 70° C., allowing said proteinaceous matter to precipitate, and separating the precipitate from the supernatant liquid.

4,111,804

NOVEL COMPOSITIONS OF MATTER FOR USE IN THE TREATMENT OF AQUEOUS SYSTEMS

Peter Miles, Stockport; Norman Richardson, Middleton, and Michael Anthony Finan, Macclesfield, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

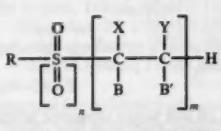
Filed Jul. 20, 1976, Ser. No. 707,126

Claims priority, application United Kingdom, Jul. 23, 1975, 30718/75

Int. Cl.² C02B *5/06*

U.S. Cl. 210—58 **12 Claims**

1. A method of inhibiting scale formation by salts of calcium, magnesium, barium and strontium from aqueous solutions which comprises adding to the aqueous solution an amount within the range of from 0.2 part to 500 parts per million, based on the water to be treated, of a product comprising a telomer of formula I



or a salt thereof, wherein X is COOH when Y is H, or Y is

COOH when X is H; B and B′ are each hydrogen, or B is CH_3 when B′ is H, or B′ is CH_3 when B is H; *m* is an integer from 2 to 100; *n* is 0 or 1; and R is alkyl having from 1 to 22 carbon atoms substituted by one or more carboxyl groups.

4,111,805

SEPARATION OF SOLVENT FROM LIQUID SULFUR

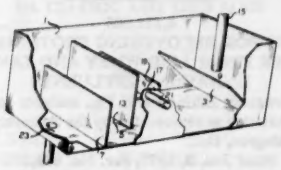
Joe Van Pool, and R. Nell Jackson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 16, 1976, Ser. No. 714,930
Int. Cl.[2] B01D *36/18*; C02B *1/02*
U.S. Cl. 210—71 **5 Claims**

1. A method for separating liquid sulfur from a liquid solvent of lower specific gravity comprising:

(a) charging an emulsion of liquid sulfur which contains an immiscible solvent of specific gravity lower than said sulfur into a first section of a heated vessel, said first section comprising an outwardly sloped baffle said baffle angled upward from the vessel floor providing egress only over the top of said baffle, to carry the flow up and away from the zone of entry thereby providing quieting of the turbulence and encouraging release of the lighter material from the heavier liquid of said emulsion, said charging at a rate of flow that allows said emulsion to break;

(b) flowing liquid sulfur and solvent out of said first zone into a second zone contained by a second baffle, within said second zone flowing said solvent over a trapout weir



into a collecting chamber and removing said solvent from said chamber;

(c) flowing said liquid sulfur under said baffle into a third zone contained by a restraining weir of sufficient height to maintain operating levels in said first and second zones; and

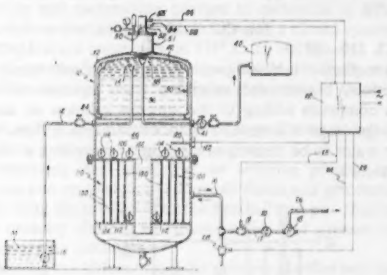
(d) flowing liquid sulfur over said restraining weir for collection and removal from said vessel.

4,111,806

GRAVITATIONAL SEPARATOR FOR MIXTURES OF IMMISCIBLE LIQUIDS OF DIFFERENT DENSITIES

David A. Wright, and Chester H. Walters, both of St. Louis, Mo., assignors to National Marine Service, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 608,905, Aug. 29, 1975, Pat. No. 4,032,444. This application Jan. 19, 1977, Ser. No. 760,661
Int. Cl.[2] B01D *12/00*
U.S. Cl. 210—115 **19 Claims**



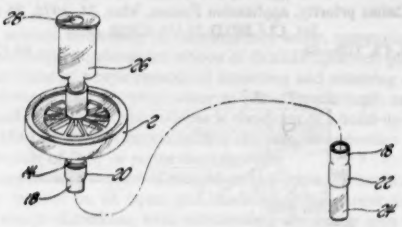
1. In a gravitational oil and water separator utilizing at least one coalescer screen within the lower area of the separator for trapping oil particles entrained in a clean water discharge flow from the separator, the water discharge from the separator occurring normally by suction of water from the separator and the screen normally being backflushed by a reverse flow of water through the screen under pressure, the separator including a water discharge outlet and backflush inlet means at the lower portion of the separator, the improvement comprising a chamber within the separator for containing the coalescer screen, the chamber being isolated from the interior of said separator except through pressure responsive one-way valve elements, at least one inlet pressure responsive one-way valve for permitting flow of water into the chamber only, and at least one pressure responsive one-way outlet valve for permitting flow of water out of the chamber only, the water discharge outlet and backflush inlet of the separator communicating with the interior of the chamber, the inlet one-way valve being located towards the lower end of the chamber and the outlet one-way valve being located at an upper end of the chamber; at least one coalescer screen in the chamber disposed entirely across the chamber with the water discharge outlet and backflush inlet means being located towards one side of the screen and said inlet and outlet valves being located towards the opposite side of the screen, whereby flow of water into the chamber during normal separator operation enters at the lower space of the chamber through the pressure responsive one-way inlet valve and backflush flow out of the chamber occurs at the upper extremity of the chamber during the backflush operation of the separator through the pressure responsive one-way outlet valve to thereby ensure the discharge of backflushed oil out of the upper area of the chamber.

4,111,807

MOUTH FILTER FOR USE WITH PIPETTES

Mary Boomus, Chelsea; Bernard Sobin, and Monty E. Vincent, both of Ann Arbor, all of Mich., assignors to Gelman Instrument Company, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 768,450, Feb. 14, 1977, abandoned. This application Oct. 11, 1977, Ser. No. 840,685
Int. Cl.[2] B01D *25/16, 29/04, 31/00*
U.S. Cl. 210—152 **3 Claims**



1. A mouth filter device for use with pipettes where suction is applied by the mouth to draw liquid into the pipette, said device comprising a flat, cylindrical, organic resin housing, a round filter membrane in and extending transverse to the axis of said housing and in sealed relationship with said housing so as to divide said housing into an inlet chamber on one side of said filter membrane and an exit chamber on the other side of said filter membrane, said filter membrane being hydrophobic thereby to allow the passage of gas therethrough while preventing the passage of liquid therethrough and said filter membrane having a submicron pore size sufficiently small to prevent the passage of bacteria therethrough, a tubular extension on and integral with one axial end of said housing extending axially from and communicating with said inlet chamber, a tubular extension on and integral with the other axial end of said housing extending axially from and communicating with said exit chamber, an elastomeric tube having one end thereof connected and communicating with said first mentioned extension, the other end of said tube being adapted to be fitted in sealed relationship to the pipette, and an organic resin mouthpiece connected to said second mentioned tubular extension

and having an opening therethrough communicating with said exit chamber whereby mouth-applied suction to said mouthpiece creates suction through the filter membrane and said tube to draw liquid into the pipette to which the tube is fitted thereby to draw liquid thereinto, said filter membrane assuring against any of the liquid or any bacteria therein reaching the mouth.

4,111,808

APPARATUS FOR SLUDGE DIGESTION

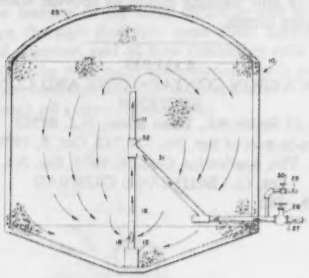
John H. Fair, 1511 Newcastle St., Colorado Springs, Colo. 80907

Continuation of Ser. No. 639,756, Dec. 11, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,793

Int. Cl.[2] C02C *3/00*

U.S. Cl. 210—197 **5 Claims**

1. A digester tank for digesting sludge therein, said tank including a roof, side walls and a bottom wall, said digester tank having an unobstructed open end updraft tube mounted therein, said updraft tube having openings at the lower end thereof for the flow of partially digested sludge through said updraft tube, a first conduit extending to a position closely adjacent to and terminating at the outside of said tank walls for the feed therethrough of a primary sludge, a second conduit connected to said first conduit outside of said tank side walls, said second conduit extending through the tank side walls and into the said digester tank, a third conduit connected to said



second conduit, outside of the said tank side walls, said third conduit connected to said second conduit for the feed thereinto a compressed gaseous medium, said compressed gaseous medium fed into said second conduit forcing said primary sludge through said second conduit and into an upwardly inclined conduit connected to said second conduit interiorly of said tank, said upwardly inclined conduit also connected to said updraft tube at the upper portion thereof, the flow of the compressed gaseous medium and sludge through the aforesaid conduits effecting a circulation of the materials within the digester tank.

4,111,809

DEVICE FOR THE REMOVAL OF A LIQUID LAYER ON WATER

Jacques Pichon, Eybens, France, assignor to Societe Generale de Constructions Electriques et Mecaniques Alsthom, Paris, France

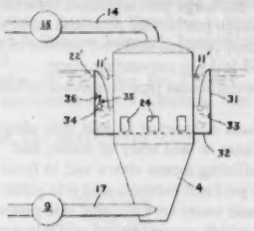
Continuation-in-part of Ser. No. 527,707, Nov. 27, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,372

Claims priority, application France, Dec. 11, 1973, 73 44189

Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—242 R **6 Claims**

1. In floating apparatus capable of removing liquid pollutant floating on the surface of a still body of water while in a stationary condition relative to the latter, a cyclone composed of a casing defining a cyclone chamber and having an enlarged end and a reduced end, the portion of said casing defining the enlarged end of the chamber having an inlet orifice for entry of a water-pollutant mixture into said chamber, a guide wall connected to said casing at said inlet orifice for directing said mixture tangentially into said chamber, a dam mounted on said cyclone casing having a water-pollutant overflow sill spaced from said casing, said dam forming with said cyclone casing a substantially closed water compartment for providing a cavity in said body of water and containing said inlet orifice, said dam in the use of the apparatus being normally submerged with its sill situated below but close to the free surface of the body of water to create with the cavity provided by said compartment a hydraulic drop with flow of water and pollutant to discharge a continuous flow of water and pollutant into said compartment to form in said compartment before the inlet orifice a level of the mixture independent of and lower than that of the free surface of the body of water being purified, the dam having a height enabling the level of the mixture in said compartment to be constantly higher than said cyclone inlet orifice whereby a continuous mixture of water and pollutant may be fed through such inlet orifice, first suction means connected to said reduced end of said cyclone casing for filling said cyclone chamber up to its ceiling with the liquid mixture from said compartment and for producing in such mixture a cyclonic rotation capable of separating the water and pollutant by centrifugation and for concentrating the pollutant in an axial central zone of the cyclone, second suction means connected to said enlarged end of said cyclone casing for removing the concentrated pollutant through the ceiling of said cyclone chamber, said first suction means removing the water freed of pollutant through said reduced end of said cyclone casing.



4,111,810

DESALINATION REVERSE OSMOTIC MEMBRANES AND THEIR PREPARATION

Shigeru Arai, Yachiyo, and Fumio Akiya, Urawa, both of Japan, assignors to Shin-Etsu Chemical Company, Tokyo, Japan

Continuation-in-part of Ser. No. 685,632, May 12, 1976, abandoned, which is a continuation of Ser. No. 448,212, Mar. 5, 1974, abandoned. This application Mar. 16, 1977, Ser. No. 778,269

Claims priority, application Japan, Mar. 8, 1973, 48/27267

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—23 H **4 Claims**

1. In a method for desalinating water wherein the water is treated with a reverse osmotic membrane, the improvement which comprises using a reverse osmotic membrane prepared by forming a film with an aqueous acid solution of chitosan salt, neutralizing the acid groups contained therein, and then acetylating the free amino groups therein to achieve a degree of acetylation of 0.3 to 0.8, said acetylation reaction being carried out at a temperature within the range of about 10° to 50° C for a time period from about 40 to 150 hours.

4,111,811

APPARATUS FOR COLLECTING EFFLUENT OIL

Shozo Fukuda; Yajuro Seike, both of Nagasaki; Masafumi Iizuka, Koganei; Hironao Kasai, and Mamoru Enami, both of Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1977, Ser. No. 780,351

Claims priority, application Japan, Apr. 1, 1976, 51-37647

Int. Cl.[2] B01D *37/00*; **E02B** *15/04*

U.S. Cl. 210—242 S **2 Claims**

1. An apparatus for collecting effluent oil from the surface of a body of water, said apparatus comprising;

a pair of side plates connected to each other with an open spaced arrangement at the forward end thereof;

a weir conected to the inside surfaces of said side plates beneath the water level of said body of water, said weir being inclined in a rear-downward direction;

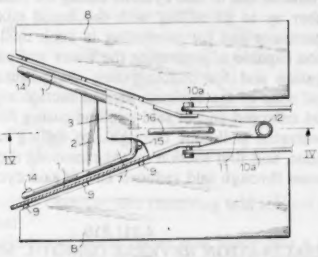
a slant plate secured to the rear inner wall surfaces of said side plates above said weir, the rear portion of said slant plate being positioned above the rear of said weir;

an oil leakage preventing plate secured to the inner surfaces of said side plates midway between the rear portion of said weir and the rear portion of said slant plate, whereby a water discharge port is formed between said weir and said oil leakage preventing plate and an oily water intake port is formed between said rear portion of said slant plate and said oil leakage preventing plate;

an oily water intake pipe connected to said oily water intake port;

float means connected to said side plates for floating said side plates in said body of water; and

wave buffering means above and in front of said oily water intake port and between said side plates in communication with said water between said side plates for receiving said water which surges toward said oily water intake port due to wave action of said body of water and subsequently returning said water between said side plates, whereby the kinetic energy of said wave action is absorbed by said buffering means, said wave buffering means comprised of:



at least one pair of vertical cylindrical wave buffer chambers above said slant plate and said oily water intake port, each chamber having a vertical cutaway opening thereinto in the side portion thereof, said openings substantially opposing each other,

a substantially v-shaped breakwater plate integrally formed with said chambers at the rearward edges of said opposed openings and projecting forward therefrom, whereby said chambers are joined together,

side wall plates on the forward edges of said openings extending backwardly and downwardly between said side plates, and

a single top plate covering both of said chambers, said top plate being curved downwardly at the forward edge thereof in front of said openings.

4,111,812

RECOVERING SURFACTANT

Raymond F. Baddour, Belmont, Mass., assignor to Energy Resources Co. Inc., Cambridge, Mass.

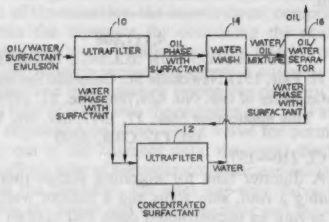
Filed Feb. 28, 1977, Ser. No. 772,670
Int. Cl.[2] B01D *13/00, 31/00*
U.S. Cl. 210—257 M **2 Claims**

1. Apparatus for recovering surfactant from an undefined oil/water/surfactant emulsion obtained from an oilfield after chemical flooding thereof, which apparatus comprises:

a first ultrafilter for breaking said emulsion into a water phase and an oil phase, each of said phases containing surfactant,

means for washing with water the oil phase produced by said first ultrafilter to extract surfactant from said oil phase, said washing means being connected to an outlet from said first ultrafilter,

means for separating said oil phase from said water used for washing and extracted surfactant, said separating means being connected to an outlet from said washing means, and



a second ultrafilter connected to an outlet from said first ultrafilter so as to receive the water phase produced by said ultrafilter and connected to an outlet from said separating means so as to receive wash water and surfactant therefrom, said second ultrafilter recovering surfactant from said water phase and wash water,

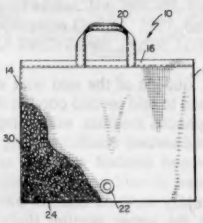
said second ultrafilter having an outlet connected to an inlet of said washing means to provide water for said washing means.

4,111,813

HYDROCARBON CONTAINMENT AND CONTROL SYSTEMS

Paul Preus, 21 Smith Rd., Toms River, N.J. 08753

Continuation-in-part of Ser. No. 729,713, Oct. 5, 1976, Pat. No. 4,065,923. This application Oct. 18, 1977, Ser. No. 843,460
Int. Cl.[2] B01D *27/02;* **C02B** *9/02*
U.S. Cl. 210—282 **1 Claim**



1. Apparatus for controlling and containing oil and the like hydrocarbons comprising a porous woven container, at least one hand grip along one edge seam thereof, at least one opening through a pair of opposed side walls but closed to the interior of the container and a closable open seam along at least one edge thereof, wherein the at least one opening through a pair of opposed side walls of the container is: centrally positioned on the container; along an edge opposite to the edge having the at least one hand grip; or the container has spaced pairs of said at least one opening through a pair of opposed side walls and said pair of openings are positioned along side edges of the container; and further wherein the porous woven container is filled with a loose mass of an oleophilic-hydrophobic-lighter than water hydrocarbon absorbent consisting of expanded pearlite mixed with clays and a fibrous filler.

4,111,814

OIL FILTER

Heinz Friedrich Knigge, The Hague, Netherlands, assignor to The Lummus Company, Bloomfield, N.J.

Filed Jan. 21, 1977, Ser. No. 761,111
Int. Cl.[2] B01D *29/24*
U.S. Cl. 210—323 T **7 Claims**

1. A filtering apparatus for separating solid coke particles from an oil, comprising:

a vessel;

a pair of axially spaced plates, including a plurality of orifices dividing the vessel into a first chamber, a second chamber between the plates and a third chamber;

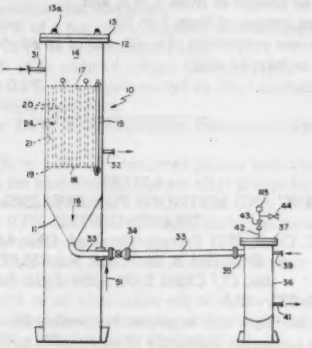
a plurality of hollow filter cartridges having open tops and bottoms supported between the pair of axially spaced plates with the open tops and bottoms in alignment with the orifices in the plates, said filter cartridges being comprised of an annular wire mesh filter screen having hole sizes to provide for effective removal of coke particles from an oil, and a perforated annular rigid support plate surrounding the wire mesh filter screen having hole sizes larger than the hole sizes of the wire mesh filter screen, said wire mesh filter screen being the inner wall of the cartridge defining a hollow interior of the cartridge in communication with the first and third chambers through the orifices in the plates whereby fluid introduced into the hollow interior of the cartridge initially flows through the wire mesh filter screen;

an inlet pipe for introducing an oil containing solid coke particles into the first chamber;

a first outlet pipe for withdrawing filtered oil from the second chamber; and

a second outlet pipe for withdrawing solid coke particles from the third chamber whereby oil containing solid coke particles introduced into the first chamber flows into the hollow interior of the filter cartridge and is filtered by passage through the wire mesh filter screens into the second chamber, said oil flow dislodging solid coke particles from the wire mesh filter screen which pass through the open cartridge into the third chamber.

5. A quench oil system, comprising:



a fractionator, a quench oil cooler and a quench oil filter, said quench oil filter comprising a filter vessel, a filter package in said vessel, said filter package comprising a pair of axially spaced plates including a plurality of aligned orifices and a plurality of hollow filter cartridges having open tops and bottoms secured to the top and bottom plates with the open tops and bottoms in alignment with the orifices in the plates, said filter cartridges being comprised of an annular wire mesh filter screen having hole sizes to provide for effective removal of coke particles from an oil, and a perforated annular rigid support plate surrounding the wire mesh filter screens having hole sizes larger than the hole sizes of the wire mesh filter screens, said wire mesh filter screens being the inner wall of the cartridge defining a hollow interior of the cartridge in alignment with the orifices in the plates, said filter unit being removably secured to the vessel and dividing the vessel into a first chamber, a second chamber between the plates and a third chamber;

an inlet pipe for introducing quench oil containing solid particles from the fractionator into the first chamber;

a first outlet pipe for withdrawing filtered oil from the second chamber for passage to the quench cooler;

a second outlet pipe for withdrawing solid coke particles from the third chamber whereby oil containing solid particles introduced into the first chamber flows into the hollow interior of the filter cartridges for initial flow through the wire mesh filter screens into the second chamber, said oil flow dislodging solid particles from the wire mesh filter screens which pass through the open cartridges into the third chamber.

4,111,815

FILTER ELEMENTS FOR GAS OR LIQUID AND METHODS OF MAKING SUCH ELEMENTS

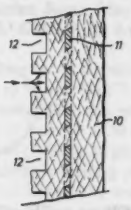
Brian Walker, Washington; George Sherwood Hunter, and Susanne Phyllis Hunter, both of Houghton-le-Spring, all of England, assignors to Process Scientific Innovations Limited, Durham, England

Filed Mar. 18, 1977, Ser. No. 779,417

Claims priority, application United Kingdom, Mar. 26, 1976, 12228/76

Int. Cl.² B01D *39/16, 39/20*

U.S. Cl. 210—487 **10 Claims**



1. A filter element comprising a sheet of comparatively rigid material formed with apertures distributed substantially uniformly over its entire area and forming a total of open areas that is at least 30% of the total area of said sheet, a unitary mass of amorphously arranged fibres, said sheet being embedded within said mass with portions of said mass of fibres passing through said apertures from one side of said sheet to the other side of said sheet, said fibres including coatings of a synthetic resin bonding material applied to the entire mass to bond said fibres to one another, including those fibres which are located within said apertures, and also to bond said apertured sheet to the fibres of said mass adjacent to said sheet, said mass being formed with opposed outer surfaces substantially parallel to said sheet, the quantity of said synthetic resin bonding material applied to said fibres being sufficient to effect said bonding while leaving said mass pervious to fluid passing therethrough between said faces.

4,111,816

PHOSPHORUS-CONTAINING POLYESTER AND SIZE COMPOSITIONS

Robert Bernard Login, Woodhaven, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 727,991, Sep. 30, 1976. This application Jun. 27, 1977, Ser. No. 810,233

Int. Cl.² D06M *13/26*

U.S. Cl. 252—8.6 **14 Claims**

1. A sized fibrous article consisting of a wrap textile fiber yarn and a sizing composition comprising a branched chain polyester which is the reaction product of:

(a) a dicarboxylic reactant consisting of a dicarboxylic acid or corresponding acid anhydride or ester,

(b) a diol selected from the group consisting of ethylene glycol, propylene glycol, and mixtures thereof; a polyoxyalkylene glycol selected from the group consisting of diethylene glycol, triethylene glycol and mixtures thereof, and

(c) a phosphorus acid reactant present in sufficient amount to render said polyester dispersible in water upon neutralization selected from the group consisting of phosphorus pentoxide, phosphoric acid and mixtures thereof.

4,111,817

HETEROCYCLIC NITROGEN COMPOUNDS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Horst Jäger, Bettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

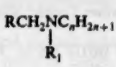
Division of Ser. No. 639,311, Dec. 10, 1975, abandoned. This application Jan. 25, 1977, Ser. No. 762,552

Claims priority, application Switzerland, Dec. 20, 1974, 17037/74

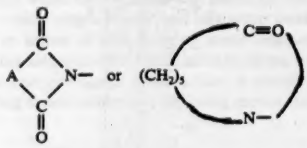
Int. Cl.[2] D06M *13/46*

U.S. Cl. 252—8.8 9 Claims

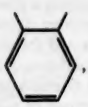
1. A method of finishing synthetic organic fibrous material, in particular of providing it with an antistatic finish and optionally simultaneously improving the dirt repellency, which comprises applying at least one compound of formula



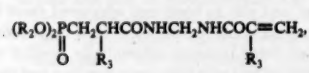
wherein R is

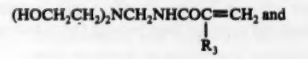


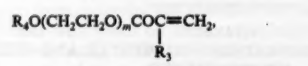
in which A is $-CH_2CH_2-$, $-CH=CH-$ or



R_1 is hydrogen or C_nH_{2n+1} and n is an integer from 1 to 24, optionally in admixture with at least one homopolymer derived from the monomers of formulae







wherein R_2 is straight-chain or branched alkyl of 1 to 8 carbon atoms, R_3 is hydrogen or methyl, R_4 is alkyl of 1 to 6 carbon atoms and m is an integer from 6 to 15, from aqueous or organic solutions or from emulsions to said material and subsequently drying it at elevated temperature.

4,111,818

PROCESSABILITY OF MELT SPUN YARNS

William Postman; James B. Louch, and Hermann Buchert, all of Anderson, S.C., assignors to Dow Badische Company, Williamsburg, Va.

Continuation-in-part of Ser. No. 680,945, Apr. 28, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,470

Int. Cl.[2] D06M *13/18*

U.S. Cl. 252—8.9 8 Claims

1. A process for improving the processability of melt spun yarns of a polymer selected from the group consisting of polyamides and polyesters, which process comprises treating the filaments with an aqeous solution of dispersion containing as the sole essential organic component thereof about 10 to 30 percent by weight of a compound selected from the group consisting of: (a) a water soluble or dispersible condensation product of one mole of a compound having the general formula R—X—H, wherein R is a saturated or unsaturated aliphatic group having from 6 to 18 carbons, and X is oxygen or sulfur; with 7 to 12 moles of ethylene oxide; and (b) a water soluble or dispersible condensation product of one mole of a compound having the general formula R—X—H, wherein R is a saturated or unsaturated aliphatic group having from 6 to 18 carbons, and X is oxygen or sulfur; with from 5 to 20 moles of ethylene oxide and from 2 to 20 moles of propylene oxide.

4,111,819

TEXTILE FIBER LUBRICANT

Herman M. Muijs, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 14, 1977, Ser. No. 850,877

Int. Cl.[2] D06M *13/18*

U.S. Cl. 252—8.9 11 Claims

1. A lubricant composition comprising a major proportion of an ether of formula:

wherein

R is a C_1 to C_{10} alkyl group,

m is an integer of from 2 to 4, and

x is an integer of from 2 to 20;

and a minor proportion of a polymer of an ethylenically unsaturated carboxylic acid.

4,111,820

COATING AND METHODS FOR PULLING CABLE AND DRAWING WIRE

Allen C. Conti, 4522 Turney, Cleveland, Ohio 44105

Filed Oct. 3, 1977, Ser. No. 839,077

Int. Cl.[2] C10M *1/06, 3/04, 5/04, 7/08*

U.S. Cl. 252—49.5 8 Claims

1. A lubricant and/or protective coating for an article, said coating consisting essentially of about 0.5% to 50% by volume polyethylene oxide and about 6% to 30% by volume a dispersion agent selected from the group consisting of propylene glycol, glycerol, ethylene glycol, polypropylene glycol, diethylene glycol, triethylene glycol and hexylene glycol,

the ratio of the volume of polyethylene oxide to the volume of said dispersion agent being no greater than 2:1,

and the remainder being water.

3. The coating according to claim 1 further consisting essentially of up to about 15% by volume lime.

6. A method for drawing wire using a ferrous, copper or brass workpiece, said method including the steps of:

controlling oxidation of the workpiece surface while inhibiting the formation of scale thereon by coating the workpiece with a solution consisting essentially of about 0.5% to 50% by volume polyethylene oxide and about 6% to 30% by volume a dispersion agent selected from the group consisting of propylene glycol, glycerol, ethylene glycol, polypropylene glycol, diethylene glycol, triethylene glycol and hexylene glycol, the ratio of the volume of polyethylene oxide to the volume of said dispersion agent being about 1:3 and the remainder being water, and

using said coating as a lubricant while drawing the coated workpiece through a die.

4,111,821

LUBRICANTS FOR RECIPROCATING COMPRESSORS FOR OXYGEN-FREE GASES

Allan K. Lazarus, Lawrenceville, and Malcolm H. Knapp, Bridgewater, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 224,223, Feb. 7, 1972, abandoned. This application Jul. 8, 1975, Ser. No. 594,179

Int. Cl.[2] C10M *1/10*

U.S. Cl. 252—49.9 7 Claims

1. A lubricant composition for use in the cylinder and drive train lubrication of reciprocating compressors for oxygen-free gases that comprises

(a) 97% to 99% of a bis(alkyl) phthalate wherein each alkyl group has 10 to 15 carbon atoms and

(b) 1% to 3% of an additive system that comprises

(i) 0.2% to 0.8% of a copolymer of an alkyl methacrylate and N-vinylpyrrolidone;

(ii) 0.8% to 2.0% of an antioxidant component that contains

((a)) 0.8% to 1.2% of an hindered phenol antioxidant wherein the hindering groups are alkyl groups having 1 to 4 carbon atoms and

((b)) 0 to 0.8% of at least one hydrocarbyl secondary or tertiary amine antioxidant;

(iii) 0 to 0.1% of a fatty acid monocarboxylate of 1-salicylalaminoguanidine; and

(iv) 0 to 0.5% of an ammonium salt of a phosphate ester, all percentages being percentages by weight based on the weight of the lubricant composition.

6. The method of lubricating a reciprocating compressor for oxygen-free gases that comprises feeding to the cylinder and drive train of said compressor from at least one reservoir a lubricant composition that comprises

(a) 97% to 99% of a bis(alkyl)phthalate wherein each alkyl group has 10 to 15 carbon atoms and

(b) 1% to 3% of an additive system that comprises

(i) 0.2% to 0.8% of a copolymer of an alkyl methacrylate and N-vinylpyrrolidone;

(ii) 0.8% to 2.0% of an antioxidant component that contains

((a)) 0.8% to 1.2% of a hindered phenol antioxidant in which the hindering groups are alkyl groups having 1 to 4 carbon atoms and

((b)) 0 to 0.8% of at least one hydrocarbyl secondary or tertiary amine antioxidant;

(iii) 0 to 0.1% of a fatty acid monocarboxylate of 1-salicylalaminoguanidine; and

(iv) 0 to 0.5% of an ammonium salt of a phosphate ester, all percentages being percentages by weight based on the weight of the lubricant composition.

4,111,822

GREASE COMPOSITIONS

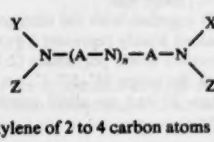
Gerard P. Caruso, New Orleans, La., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 751,765, Dec. 16, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 839,153

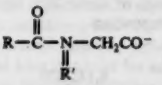
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*

U.S. Cl. 252—51.5 A 2 Claims

1. A grease composition comprising of a major amount of a lubricating oil base vehicle, a polyurea gellant in an amount sufficient to thicken the base vehicle to a grease consistency, and a minor amount of an acylated alkylene polyamine or mixture of acylated alkylene polyamines, the acylated alkylene polyamine or acylated alkylene polyamines having the formula



wherein A is alkylene of 2 to 4 carbon atoms and *n* is an integer of from 0 to 3, X is H or Z, Y is selected from H, alkyl containing 12 through 22 carbon atoms, and Z, and Z is an acyl group having the formula



wherein R is alkyl containing 2 through 22 carbon atoms, and R′ is hydrogen or alkyl containing 1 through 3 carbon atoms.

4,111,823

DRY DEVELOPING POWDER INCLUDING TONER POWDERS OF DIFFERENT PARTICLE SIZE

Kazuo Kobayashi; Akira Suzuki; Motoharu Tanaka; Norihiko Inaba, and Hisao Yuyama, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 20, 1977, Ser. No. 798,995

Claims priority, application Japan, May 28, 1976, 51-61965

Int. Cl.[2] G03G *9/14, 9/08*

U.S. Cl. 252—62.1 P 12 Claims

1. A dry developing powder composition consisting essentially of a blend from 70 to 98 wt. % of Toner A particles and from 2 to 30 wt. % of Toner B particles, said Toner A particles having a mean grain size of from 10 to 30 microns and consisting essentially of a blend of (1) 20 to 80 parts by weight of wax or thermoplastic resin having a melting point of about 35° to 160° C., and (2) from 80 to 20 parts by weight of a pulverized magnetic substance having a mean grain size of from 0.1 to 2.5 microns, said Toner B particles having a mean grain size of from 5 to 20 microns and smaller than the mean grain size of said Toner A particles, said Toner B particles consisting essentially of (3) thermoplastic resin having a melting point of about 35° to 160° C., said Toner B being free of pulverized magnetic substance.

7. A dry developing powder composition consisting essentially of a blend of from 70 to 98 wt. % of Toner A particles and from 2 to 30 wt. % of Toner B particles, said Toner A particles having a mean grain size of from 10 to 30 microns and consisting essentially of a blend of (1) 20 to 80 parts by weight of wax or thermoplastic resin having a melting point of about 35° to 160° C., and (2) from 80 to 20 parts by weight of a pulverized magnetic substance having a mean grain size of from 0.1 to 2.5 microns, said Toner B particles having a mean grain size of from 5 to 20 microns and smaller than the mean grain size of said Toner A particles, said Toner B particles consisting essentially of a blend of (3) from 60 to 90 parts by weight of thermoplastic resin having a melting point of about 35° to 160° C. and (4) from 40 to 10 parts by weight of pulverized magnetic substance having a mean grain size of from 0.1 to 2.5 microns, the amount of said pulverized magnetic substance (4) in Toner B being less than the amount of pulverized magnetic substance (2) in Toner A.

4,111,824

LIQUID DIELECTRIC COMPOSITION BASED ON A FRACTION DERIVED FROM THE ALKYLATION PRODUCT OF BENZENE WITH ETHYLENE

Johann G. D. Schulz, Pittsburgh; Charles M. Selwitz, and Anatoli Onopchenko, both of Monroeville, all of Pa., assignors to Gulf Research & Development Co., Pittsburgh, Pa.

Filed Jul. 21, 1977, Ser. No. 817,693

The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.

Int. Cl.[2] C10M *3/10*; H01B *3/22*

U.S. Cl. 252—63 6 Claims

1. A liquid dielectric composition obtained as a result of a process which comprises reacting benzene with ethylene in the presence of an alkylation catalyst to obtain an alkylation product containing largely unreacted benzene, ethylbenzene, po-

lyethylbenzenes, 1,1-diphenylethane and heavier products, separating benzene, ethylbenzene and polyethylbenzenes from said alkylation product and thereafter recovering from said heavier products the entire fraction whose boiling point is in the temperature range of about 255° to about 420° C. as said liquid dielectric composition.

4,111,825

LIQUID DIELECTRIC COMPOSITION BASED ON A FRACTION DERIVED FROM THE ALKYLATION PRODUCT OF BENZENE WITH ETHYLENE

Johann G. D. Schulz, Pittsburgh; Charles M. Selwitz, and Anatoli Onopchenko, both of Monroeville, all of Pa., assignors to Gulf Research & Development Co., Pittsburgh, Pa.

Filed Jul. 21, 1977, Ser. No. 817,695

The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.

Int. Cl.² C10M *3/10*; H01B *3/02*

U.S. Cl. 252—63 **5 Claims**

1. A liquid dielectric composition obtained as a result of a process which comprises reacting benzene with ethylene in the presence of an alkylation catalyst to obtain an alkylation product containing largely unreacted benzene, ethylbenzene, polyethylbenzenes, 1,1-diphenylethane and heavier products, separating benzene, ethylbenzene, polyethylbenzenes and 1,1-diphenylethane from said alkylation product and thereafter recovering from said heavier products a fraction having a boiling point in the temperature range of about 275° to about 420° C. as said liquid dielectric composition.

4,111,826

BLEACHING ASSISTANTS

Arthur George Leigh, and Robin John Green, both of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 2, 1976, Ser. No. 737,980

Claims priority, application United Kingdom, Nov. 3, 1975, 45661/75

Int. Cl.² C11D *7/22*, *10/02*

U.S. Cl. 252—89 R **5 Claims**

1. A bleaching assistant in the form of co-granulated particles having a diameter of from 0.2 mm to 3.0 mm for use in or with washing and bleaching compositions, consisting essentially of:

(a) 50 to 85% by weight of at least one bleaching activator for percompounds, having a titre in a peracid formation test of at least 1.5 ml 0.1N sodium thiosulphate, selected from the group consisting of:
- (i) N-diacylated and N,N'-tetraacylated amines;
- (ii) N-alkyl-N-sulphonyl carbonamides;
- (iii) N-acylated cyclic hydrazides;
- (iv) O,N,N-trisubstituted hydroxylamines;
- (v) N,N'-diacyl-sufphurylamides;
- (vi) Triacyl cyanurates;
- (vii) Carboxylic acid anhydrides;
- (viii) Sugar esters;
- (ix) 1,3-Diacyl-4,5-diacyloxy-imidazolidine;
- (x) Tetraacetyl glycoluryl and tetrapropionylglycoluril;
- (xi) Diacylated 2,5-diketopiperazines;
- (xii) Acylation products of propylene diurea; and
- (xiii) Carbonic acid esters;

(b) 2 to 25% by weight of at least one stabilizing agent for percompounds selected from the group consisting of:
- (i) ethane-1-hydroxy-1,1-diphosphonic acid, and its alkalimetal salts;
- (ii) aminotri-(methylene phosphonic acid) and its alkalimetal salts;
- (iii) ethylene diamine-tetra-(methylene phosphonic acid) or its alkalimetal salts; and
- (iv) ethylene diamine-tetraacetic acid or its alkalimetal salts; and

(c) 7 to 30% by weight of a nonionic surface-active compound selected from the group consisting of water-soluble polyalkylene oxide adducts of natural or synthetic, primary or secondary alcohols; polyalkylene oxide adducts of fatty acids, polyalkylene oxide adducts of fatty amides; polyalkylene oxide adducts of alkylphenols, each having 5–25 ethylene oxide groups in the molecule and 8–22 carbon atoms in the hydrophobic moiety; and polyethylene oxide adducts of polypropylene glycol containing 20 to 300 ethylene glycol ether groups and 10 to 100 propyleneglycolether groups; said nonionic compound having a melting point of at least 35° C.

4,111,827

AEROSOL FOAMS

John Thompson, Maidenhead, and Adrian Pitfield, High Wycombe, both of England, assignors to Wilkinson Sword Limited, England

Filed Feb. 27, 1976, Ser. No. 662,265

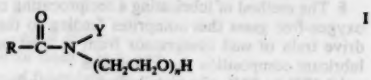
Claims priority, application United Kingdom, Feb. 27, 1975, 8249/75

Int. Cl.² C11D *17/00*

U.S. Cl. 252—90 **5 Claims**

1. An aerosol shaving foam dispenser containing an aqueous soap-free surfactant concentrate, and emulsified or readily emulsifiable therewith, a gaseous aerosol propellant in liquid phase, said concentrate consisting essentially of water and;

(i) from 1–15% by weight of the concentrate of a nitrogen-containing surfactant selected from the group consisting of:



I

where

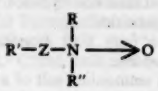
R is a straight chain C_{12}–C_{18} alkyl group;

Y is H or $(CH_2CH_2O)_mH$, where m is an integer of from 1–30;

n is an integer of from 1–30; and

the total of $n + m$ is from 1–40;

and with the proviso that, when Y is H, then n is greater than 10;



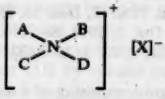
II

where

R' is a straight chain C_{11}–C_{17} alkyl group;

R'' is C_1–C_3 alkyl; and

Z is CH_2 or $CH_2CONH(CH_2)_x$—, where x is an integer of from 2–5; and



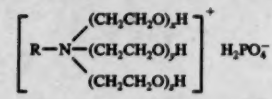
where A is a straight chain C_{12}–C_{18} alkyl group, X is an anion and B, C, and D represent one of the following combinations:

(i) B, C and D are each separate C_1–C_3 alkyl groups;

(ii) B and C are each $(CH_2CH_2O)_y$ where y is an integer with B and C together providing a total of 2–12 ethoxy units and D is C_1–C_3 alkyl; and

(iii) B, C and D together with the nitrogen atom to which they are attached jointly represent a pyridine nucleus; or a water-dispersible lauric polyamide (2:1), having a melting point in the range 53°–57° C., an acid number not greater than 10 and an alkali number in the range 136–156; or

a tris-(polyoxyethylene) alkyl ammonium phosphate of the formula



IV

where R is a straight chain C_{12}–C_{18} alkyl group and *x*, *y* and *z* are integers of from 1–20;

(ii) from 0.5–6% by weight based on the concentrate, of a long chain fatty alcohol containing from 12–18 carbon atoms; and

(iii) from 1–15% by weight based on the concentrate of (a) a water-soluble or insoluble synthetic nonionic surfactant having an HLB value of from 3–40 and containing, as its hydrophobic part a straight chain alkyl group of from 12–18 carbon atoms or alkyl-substituted benzene or napphthalene group containing a straight chain alkyl substituent of from 5–12 carbon atoms, (b) a long chain alkyl sulphosuccinate containing from 12–18 carbon atoms in the alkyl group or a benzene or napththalene sulphosuccinate containing a straight chain alkyl substituent of from 5–12 carbon atoms on the aromatic nucleus, or (c) an N-coconut-acyl-N-methyl taurate, the weight ratio of components (i) and (iii) together to component (ii) being from 0.5:1 to 12:1 and the three components of the concentrate being such that the HLB value is from 8–18.

4,111,828

STORAGE STABLE POLYOL MIXTURE

Donald S. T. Wang, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 3, 1977, Ser. No. 756,314

Int. Cl.[2] C08G *18/18*; C08K *5/52*; C08G *18/32*

U.S. Cl. 252—182 **13 Claims**

1. In a B-side mixture used to prepare a flame retarded urethane polymer foam, said mixture comprising a sucrose-based polyol prepared by reacting sucrose with alkylene oxide, a β-halophosphonate and a catalyst, the improvement which comprises using as said catalyst a hydroxylamine selected from dimethylamino-2-propanol, methyl-di-ethanolamine, triethanolamine and a mixture of o- and p-dimethylaminomethyl phenols.

4,111,829

DEVICE FOR DESTROYING FOAM

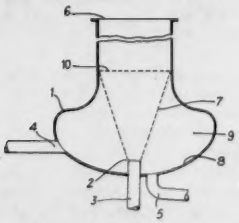
Jean-Pierre Bimond, and Flavien Lazarre, both of Pau, France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Continuation-in-part of Ser. No. 688,838, May 21, 1976, abandoned. This application Jan. 3, 1977, Ser. No. 756,189

Claims priority, application France, Jul. 31, 1975, 75 23891

Int. Cl.[2] B01D *19/00*

U.S. Cl. 252—361 **2 Claims**



1. A device for the destruction of foam due to the emulsion of gas in liquid which comprises, a container equipped with, means for injecting a gas under pressure into said container, at least one inlet for the admission of foam, at least one outlet for separated liquid, and at least one outlet for separated gas, and in which both said injecting means directs said gas into a divergent conical jet having conical sides, and said foam inlet opens into a space between the outside of the sides of said jet and an internal surface of the container, and wherein said means for injecting a gas comprises an injector tube having a straight injector section, said at least one inlet for admitting foam comprises a duct projecting into the container, coaxially with and outside the injector tube, said duct opening into the container and having a straight section which projects beyond the end of the injector tube by a distance of the order of three times the diameter of the coaxial duct.

4,111,830

METHOD OF INHIBITING CORROSION

Ramon A. Bannister, P.O. Box 593, Sullivan's Island, S.C. 29482

Filed Sep. 29, 1976, Ser. No. 727,416

Int. Cl.[2] C09K *3/00*

U.S. Cl. 422—17 **7 Claims**

1. A method of inhibiting corrosion of metals which contact aqueous containing fluids which comprises, adding to the fluid a synergistic mixture of water soluble cations in a corrosion inhibiting amount, said synergistic mixture consisting essentially of a mercuric cation and a metal cation selected from the group consisting of Group IB metals, Group IIB metals, and lead; and contacting the metal with the corrosion inhibiting fluid.

4,111,831

INHIBITING CORROSION OF STAINLESS STEEL BY RUTHENIUM-CONTAINING NITRIC ACID SOLUTION

Roy F. Maness, Richland, Wash., assignor to Exxon Nuclear Company, Inc., Bellevue, Wash.

Filed Jun. 3, 1976, Ser. No. 692,590

Int. Cl.[2] C09K *3/00*

U.S. Cl. 422—12 **15 Claims**

1. A method of inhibiting the corrosive effect of a nitric acid solution towards stainless steel, said solution containing dissolved ruthenium values present in an oxidation state of at least +4 which comprises treating said solution with a reducing agent consisting essentially of nitrogen dioxide in an amount sufficient to reduce substantially all of the dissolved ruthenium values having an oxidation state of at least +4 to an oxidation state of less than +4.

4,111,832

PROCESS FOR REGENERATING SPENT VANADIUM OXIDE CONTAINING OXIDATION CATALYSTS

Klaus Rohbock, Krefeld; Rudolf Wiemers, Meerbusch; Peter Woditsch, and Reinhard Thiel, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 22, 1976, Ser. No. 743,725

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1975, 2552456

Int. Cl.[2] B01J *23/94, 23/92, 27/28*

U.S. Cl. 252—412 **10 Claims**

1. A process for regenerating a deactivated V_2O_5: P_2O_5: CuO hydrocarbon oxidation catalyst which comprises contacting the deactivated oxidation catalyst with a solution consisting essentially of an aqueous solution of ammonia and/or an amine at a temperature of from 100° to 250° C., whereby to dissolve at least partially the catalytically effective constituents of of the catalyst, drying the resultant solution or suspension and calcining the same at temperatures between 300° and 650° C. in the presence of air, grinding the resultant solid and thereafter molding the same into a final catalyst form.

4. A process according to claim 1 wherein the temperature is from 130° to 180° C.

7. A process according to claim 1 wherein an amine is used which amine has the formula

wherein

R^1, R^2 and R^3 are independently selected from the group consisting of hydrogen, aliphatic, cycloaliphatic, araliphatic and aromatic radicals.

10. A process according to claim 1 wherein an aqueous solution of dimethylamine is employed.

4,111,833

ACTIVATED CARBON MATERIAL

A. Gary Evans, North Augusta, S.C., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 5, 1974, Ser. No. 503,547

Int. Cl.[2] B01J *27/06, 27/08*

U.S. Cl. 252—429 R **15 Claims**

1. A carbon material having improved iodine retention properties consisting essentially of activated carbon materials impregnated with iodine, KI or mixtures thereof with basic potassium compounds wherein the ratio of I to K in said impregnated carbon material is less than about 1.0 and the pH of an aqueous extract of said carbon material is greater than about 8.0.

6. The carbon material of claim 1 wherein said activated carbon material also contains the compound triethylenediamine in amounts between about 0.5% and 5% by weight.

4,111,834

PROCESS FOR PREPARING A TRANSITION METAL COMPOUND AND IT'S USE AS A COMPONENT IN AN OLEFIN POLYMERIZATION CATALYST

Anthony David Caunt, Welwyn Garden City, and Ian Gabriel Williams, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 21, 1976, Ser. No. 688,545

Claims priority, application United Kingdom, May 28, 1975, 23336/75; May 28, 1975, 23335/75

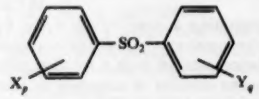
Int. Cl.[2] B01J *31/02*

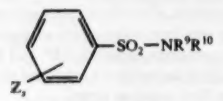
U.S. Cl. 252—429 B **13 Claims**

1. A process for the treatment of a transition metal compound which comprises grinding a solid compound of a transition metal of Groups IVA to VIA of the Periodic Table in the presence of at least two Lewis Acid compounds which are aluminium chloride and titanium tetrachloride and which are different from the solid compound of the transition metal, and at least one organo-Lewis Base compound selected from the group consisting of compounds of one of the formulae:

$R^1R^2R^3P(O)_m$

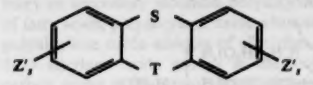
$R^5R^6NC_nH_{2n}NR^5R^6$





$R^{11}R^{12}P(Q)_pED$ or

-continued



where

R^1, R^2 and R^3 are each, independently, an alkyl or aryl group, or a group $—NR_2^4$ or $—OR^4$;

R^4 is an alkyl group of 1 to 4 carbon atoms;

R^5 and R^6 are hydrocarbyl groups;

X, or each X, is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $—NR^8R^9$, or two groups X can together form a saturated or unsaturated hydrocarbon ring;

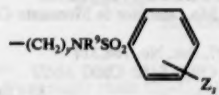
Y, or each Y, is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $—NR^8R^9$, or two groups Y can together form a saturated or unsaturated hydrocarbon ring, or a group X and a group Y may be replaced by a link between the two phenyl groups attached to the $—SO_2—$ group, the linkage being either direct or through a group —O—, $—CH_2—$, $—NR^8—$, —S— or —CO—;

R^8 is a hydrogen atom or a hydrocarbyl group;

R^9 is a hydrocarbyl group;

Z, or each Z is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $—NR^8R^9$, or two groups Z can together form a saturated or unsaturated hydrocarbon ring;

R^{10} is a hydrocarbyl group or a group



R^{11} is a halogen atom, a hydrocarbyl group, a group $—NR_2^9$ or $—OR^9$, a heterocyclic group or a group (E-L-G);

R^{12} is a halogen atom, a hydrocarbyl group, a group $—NR_2^9$ or $—OR^9$, a heterocyclic group, a group (E-L-G) or ED; each E is —O—, —S—, or $—NR^9—$, and may be the same or different;

G is $—OR^9$, $—SR^9$, $—NR^9_2$, $—PR^9_2$ or a heterocyclic ring system whereof the heteroatom is O, S, N, or P;

D is a group —LG or $—P(Q)_pR^{11}R^{12}$, or, when R^{12} is ED, both the D groups may together form a group —L—;

L is a bivalent hydrocarbyl radical such that E and G or E and E are separated by not more than 3 carbon atoms;

Q is an oxygen or sulphur atom;

T is —S—, —O—, $—NR^9—$; or —CO—;

Z', or each Z', is independently a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio or arylthio group, or a group $—NR^8R^9$;

m is 0 or 1;

n is 1, 2 or 3;

p and *q* are each, independently, an integer from 0 up to 5;

s is an integer from 0 up to 5;

y is a positive integer; and

z is 0 or 1,

wherein the grinding is effected in the presence of a total amount of aluminium chloride in the range from 0.34 up to 1.83 mole for each gramme atom of the transition metal which is present in the solid compound of the transition metal; the number of moles of the organo-Lewis Base compound does not exceed the number of gramme atoms of the transition metal which is present in the solid compound of the transition metal, and the grinding being effected at a temperature of from −10° C. up to 100° C. for a time of at least 5 hours.

9. The process of claim 1 wherein grinding is effected by ball milling at a temperature from −10° C. up to 100° C. for a time of from 5 hours up to 100 hours.

4,111,835

CATALYSTS FOR POLYMERIZING OLEFINS TO SPHEROIDAL-FORM POLYMERS

Giorgio Foschini; Nicolino Fiscelli, and Paolo Galli, all of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Sep. 17, 1976, Ser. No. 724,362
Claims priority, application Italy, Sep. 18, 1975, 27385 A/75
Int. Cl.[2] C08F *4/02, 4/10*
U.S. Cl. 252—429 C 7 Claims

1. Components of magnesium halide-supported catalysts for polymerizing olefins to spheroidally shaped polymers highly resistant to crumbling, which components comprise the product of reaction between (A) a hydrated Mg halide in the form of spheroidal particles having a particle size of from 10 to 70 microns, and containing from 10% to 45% by weight of crystallization water, and (B) a halogenated titanium compound selected from the group consisting of halides, haloalcoholates and the Ti salts of halogenated oganic acids, said components having a particle size of from 10 and 70 microns and being further characterized in showing a resistance to supersonic vibrations of 50 to 90 Watt. h/l., a specific area of from 10 to 70 $m^2/g.$, and a mean radius of the pores of from 30 to 150 A.

4,111,836

PROCESS FOR FORMING HIGH PERFORMANCE TITANIUM TRICHLORIDE OLEFIN POLYMERIZATION CATALYST COMPONENTS

Nicholas M. Karayannis, and Harold Grams, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 3, 1976, Ser. No. 738,390
Int. Cl.[2] C08F *4/64*
U.S. Cl. 252—429 B 9 Claims

1. In a process for preparing a brown solid comprising beta titanium trichloride and some, up to ten mol percent, of at least one first organic electron pair donor compound selected from the group consisting of hydrocarbyl ethers, said brown solid having a surface area above about eighty square meters per gram and a pore volume above about one-tenth cubic centimeter per gram and made by process comprising

(a) reducing titanium tetrachloride with a reductant comprising a lower alkyl dialkylaluminum compound,

(b) contacting the solid product of (a) with said first donor compound and heating from about ambient to about 80° C.

(c) thereafter treating the solid product of (b) with titanium tetrachloride, the improvement which consists essentially of contacting in a separate step an additional organic electron pair donor compound selected from the group consisting of hydrocarbyl esters, amines, organic borates, or coordinating cyclic hydrocarbons containing at least one double bond at about 10° C. to about 45° C. with the product of (b) or (c) above prior to use of said solid in polymerization.

4,111,837

HOMOLOGATION OF ALKANOLS

Paul D. Taylor, Clinton, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 718,695, Aug. 30, 1976. This application Jul. 12, 1977, Ser. No. 814,977
Int. Cl.[2] B01J *31/28*
U.S. Cl. 252—430 3 Claims

1. A heterogeneous co-catalyst adapted for homologation of alkanol with hydrogen and carbon monoxide which consists essentially of an alkanol solution of cobalt carbonyl in contact with surface-active rhenium metal, wherein the cobalt carbonyl is present in a quantity between about 0.001 and 20 weight percent, based on the weight of cobalt and alkanol, and the cobalt and rhenium are provided in an atomic ratio in the range between about 0.1 and 50 to 1 of cobalt to rhenium.

4,111,838

COMPOSITION FOR CHROMATOGRAPHY

James Robert Schaeffer, Rochester; Roy Eugene Snoke, Webster, and Harry Wayne Harris, Hamlin, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 9, 1977, Ser. No. 832,035
Int. Cl.[2] B01D *15/08*
U.S. Cl. 252—430 20 Claims

1. A composition comprising an inorganic support having a high surface density of hydroxyl groups and, covalently attached thereto, particles of polysaccharide to form an inorganic support-polysaccharide particle matrix.

4,111,839

NICKEL BIS-ORGANO-ORTHOSPHOSPHATE COMBINATION CATALYST

Jeffrey G. Meyer, Adrian, Mich., assignor to Anderson Development Company, Adrian, Mich.

Continuation-in-part of Ser. No. 416,390, Nov. 16, 1973, abandoned. This application Nov. 10, 1975, Ser. No. 630,323
Int. Cl.[2] B01J *31/12*
U.S. Cl. 252—431 P 4 Claims

1. A combination catayst for controlled olefin oligomerization consisting essentially of the reaction product of (A) a nickel bis-diorgano-orthophosphate of the formula $NI[OP(O)(OR)_2]_2$, in which each R is a member of the group consisting of alkyl having 1 to 8 carbon atoms, alkoxyalkyl having 3 to 6 carbon atoms, and cycloalkyl, and the chlorinated and brominated derivatives thereof, and (B) an alkyl aluminum halide of the formula R'_cAlX_d in which each R′ is alkyl having 1 to 6 carbon atoms, each X is chlorine or bromine, each of *c* or *d* is 1 or 2 and the total of *c* and *d* is 3, the mol ratio of (A) to (B) ranging from 1:1 to 1:20.

2. A combination catalyst for olefin polymerization consisting essentially of the reaction product of (A) a nickel bis-diorgano-orthophosphate of the formula $Ni[OP(O)(OR)_2]_2$, in which each R is a member of the group consisting of alkyl having 1 to 8 carbon atoms, alkoxyalkyl having 3 to 6 carbon atoms, and cycloalkyl, and the chlorinated and brominated derivatives thereof, (B) an alkyl aluminum halide of the formula R'_cAlX_d in which each R′ is alkyl having 1 to 6 carbon atoms, each X is chlorine or bromine, each of *c* and *d* is 1 or 2 and the total of *c* and *d* is 3, the mol ratio of (A) to (B) ranging from 1:1 to 1:20, and (C) a vanadium bis-diorgano-orthophosphate of the formula $V(O)[OP(O)OR)_2]_2$ in which each R is as defined above, the mol ratio of (C) to (B) ranging from 1:4 to 1:10.

4,111,840

NICKEL-RHENIUM HYDROGENATION CATALYST AND METHODS OF PREPARING SAME AND USING SAME

Donald Charles Best, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 647,065, Jan. 7, 1976. This application Oct. 6, 1976, Ser. No. 730,291
Int. Cl.[2] B01J *21/02, 29/06*
U.S. Cl. 252—432 16 Claims

1. A catalytic composition having high activity and selectivity in the amination of lower aliphatic alkane derivatives to the corresponding alkylamine, said catalyst comprising rhenium, nickel and boron impregnated on a support material selected from the group consisting of α-aluminas, silicas, silica-aluminas, kieselguhrs, diatomaceous earth and silica-Titanias wherein the ratio of nickel to boron to rhenium is in the range of from about 2:2:1 to about 30:30:1 and the total nickel, boron and rhenium present is in the range of about 3 to about 30 percent by weight of the support material, wherein said catalyst is activated by reduction in the presence of hydrogen at elevated temperature.

4,111,841

CATALYSTS FOR THE HYDROTREATMENT OF HYDROCARBONS AND A PROCESS FOR PREPARATION AND APPLICATION OF SAID CATALYSTS

Joseph-Edouard Weisang, and Philippe Engelhard, both of Le Havre, France, assignors to Compagnie Francaise de Raffinage, France

Filed Feb. 13, 1975, Ser. No. 549,845
Claims priority, application France, Feb. 13, 1974, 74 04895
Int. Cl.[2] B01J *27/04, 27/08, 27/10*
U.S. Cl. 252—439 25 Claims

1. An improved platinum-containing catalyst for the hydrotreatment of hydrocarbons consisting essentially of the following:

a refractory mineral oxide carrier;

from about 0.4 to about 2% of halogen, present in combined form with other catalyst components;

from about 0.02 to about 2% of at least one platinum-group metal ingredient;

from about 0.02 to about 2% of at least one additional manganese ingredient; and

from about 0.02 to about 2% of a tin ingredient; said weight percentages being calculated with respect to the elemental form and based on the total catalyst weight.

2. A catalyst according to claim in sulfurized form and containing from about 0.05 to about 0.5% of sulfur based on the total catalyst weight.

4,111,842

PROCESS FOR THE PREPARATION OF SUPPORTED CATALYSTS

Abraham van Montfoort, Geleen, and Joseph J. F. Scholten, Sittard, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Jun. 1, 1977, Ser. No. 802,533
Int. Cl.[2] B01J *21/18*
U.S. Cl. 252—447 5 Claims

1. A process for preparing an activated carbon-supported catalyst, which consists essentially in

mixing an activated carbon having acidic surface groups thereon with an aqueous solution containing at least one catalytically active metal cation or metal complex cation selected from the class consisting of metals of Group IB and VIII of the Periodic System of Elements and zinc, whereby said catalytically active cation is transferred to the surface of said activated carbon by ion exchange,

separating said thus treated activated carbon from said aqueous solution, and thereafter

reducing said transferred surface cations on said activated carbon in a reaction medium to be catalyzed using the catalyst produced, and which is inert to said reduction,

so that a free metal coated activated carbon-supported catalyst composition is obtained.

4,111,843

SILICA-ALUMINA AND SILICA CATALYST SUPPORT BODIES

Gerald R. Feistel, Hinsdale, and George N. Pessimisis, Berwyn, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed May 6, 1977, Ser. No. 794,689
Int. Cl.[2] B01J *21/08, 29/00;* C01B *33/12*
U.S. Cl. 252—451 2 Claims

1. In a process where porous microspherical, microporous silica particles useful in catalysts are prepared by adding a mineral acid to a body of aqueous sodium silicate starting material to precipitate silica in hydrous form, after which the product is filtered, purified and dried: the improvement characterized by said body of aqueous sodium silicate starting material, before acid is added, being treated with Na_2O so that the alkali expressed as Na_2O in the starting material is substantially in excess of that required to form water glass and in an amount sufficient to produce micro pores of an appreciably larger diameter compared to pore size distribution when the body of sodium silicate is in water glass proportion without excess alkali.

4,111,844

SYNERGISTIC MICROBICIDAL COMPOSITION

Rudolf Polony; Adolf Räuchle, and Fritz Heizler, all of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,565
Claims priority, application Switzerland, Dec. 15, 1975, 16278/75; Oct. 14, 1976, 13008/76
Int. Cl.[2] C11D *1/12, 3/48*
U.S. Cl. 252—106 12 Claims

1. A synergistic microbicidal composition consisting of

(A) from about 20 to 50000 ppm, based on the weight of said composition, of 2, 4,4'-trichloro-2'-hydroxy diphenyl ether,

(B) an anionic surfactant selected from the group consisting of alkylsulphonates, alkylsulphates, alkylnaphthalenesulphonates and dialkylsulphosuccinates and

(C) water

said component B being present in the composition at a ratio of A to B ranging from 1:2 to 1:30.

4,111,845

CRACKING CATALYST MODIFIED BY ANTIMONY THIOPHOSPHATE

Dwight L. McKay, Bartlesville, Okla.

Filed Feb. 11, 1977, Ser. No. 768,001
Int. Cl.[2] B01J *23/18, 8/24;* C10G *11/06*
U.S. Cl. 252—455 Z 5 Claims

1. A cracking catalyst composition consisting essentially of an unused catalytic cracking component useful for cracking of hydrocarbons in the absence of added hydrogen, said component having less than about 40 wt. % zeolite content and antimony in a concentration of about 0.005 to about 5 weight percent calculated as the elemental antimony and based on said unused catalytic cracking component and wherein said antimony is derived from antimony tris(O,O-dihydrocarbyldithiophosphate).

4,111,846

HYDROSOL AND CATALYST PREPARATION

Curtis Homer Elliott, Jr., Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 796,644, May 6, 1977, abandoned, which is a continuation of Ser. No. 596,922, Jul. 17, 1975, Pat. No. 4,022,714. This application Aug. 17, 1977, Ser. No. 825,327
Int. Cl.[2] B01J *29/06, 13/00*
U.S. Cl. 252—455 Z 15 Claims

1. A titania-alumina-silica hydrosol which comprises the following amounts by weight TiO_2, Al_2O_3, SiO_2 and H_2O:

(a) 0.01 to 0.12 parts TiO_2 per part SiO_2,

(b) 0.01 to 0.15 parts Al_2O_3 per part SiO_2, and

(c) 6 to 25 parts H_2O per part SiO_2,

said hydrosol having a pH of from about 2.5 to 3.5.

6. A process for preparing hydrocarbon conversion catalysts which comprises:

(a) preparing an aqueous slurry of a crystalline aluminosilicate zeolite and a titania-alumina-silica hydrosol binder, said hydrosol binder comprising the following amounts by weight TiO_2, Al_2O_3, SiO_2 and H_2O:

(1) 0.01 to 0.12 parts TiO_2 per part SiO_2,

(2) 0.01 to 0.15 parts Al_2O_3 per part SiO_2, and

(3) 6 to 25 parts H_2O per part SiO_2

said hydrosol having a pH of from about 2.8 to 3.2; and

(b) spray drying said slurry to form discrete catalyst particles.

4,111,847

METHANOL SYNTHESIS CATALYST

Alvin B. Stiles, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 245,902, Apr. 20, 1972, abandoned. This application Nov. 8, 1973, Ser. No. 413,829

Int. Cl.[2] B01J *21/04, 21/10, 23/06, 23/72*

U.S. Cl. 252—463 4 Claims

1. A copper oxide-zinc oxide catalyst useful for the production of methanol prepared by (a) coprecipitating zinc and copper carbonates from an aqueous solution of the metal nitrates containing very low amounts of sodium and sulfate ions using ammonium carbonate, bicarbonate or mixtures thereof as the sole precipitant by controlling the pH at about 6.8 at a solution temperature in the range of 30° to 80° C. and (b) drying and calcining the resultant coprecipitate at a temperature in the range of 375° to 425° C. to form the oxides of the metals, the sodium and sulfur contents of the calcined catalyst each being less than 100 ppm and the atomic ratio of copper to zinc being from 1:1 to 8:1, said catalyst having incorporated in it 5 to 65% by weight of the total ingredients of a stabilizer selected from alumina, zirconia, titania, calcia or magnesia.

4,111,848

CATALYST FOR OXIDATION OF CARBON MONOXIDE AND HYDROCARBONS IN COMBUSTION ENGINE EXHAUST GAS

Shinkity Torii, Kanagawa; Sakae Kawagoshi, Yokohama; Tetsuhiko Yoneshige, Yokohama, and Hidehumi Ito, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 16, 1977, Ser. No. 807,191

Claims priority, application Japan, Jun. 17, 1976, 51-70352

Int. Cl.[2] B01J *21/04, 23/56*

U.S. Cl. 252—466 PT 10 Claims

1. A catalyst for conversion of carbon monoxide and hydrocarbons in the exhaust gas of a combustion engine, the catalyst consisting essentially of a carrier of active alumina and at least one catalytic metal which is selected from the group consisting of Pt, Pd, Rh and Ir and is distributed upon said carrier, the total amount of said at least one catalytic metal being in the range from 0.03 to 0.3 Wt% of the catalyst, both the amount of Rh and the amount of Ir being 0–0.03 Wt%, the catalyst being produced by a method comprising the steps of impregnating said carrier with an aqueous solution of at least one thermally decomposable compound of a catalytic metal selected from said group, and baking the impregnated carrier in a stream of substantially 100% steam at a temperature between 300° and 600° C.

4,111,849

LOW COPPER NO_x REDUCTION CATALYST

Robert J. Fedor, Westlake, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 249,884, May 3, 1972, abandoned. This application Nov. 13, 1972, Ser. No. 305,738

Int. Cl.[2] B01J *23/72, 23/76*

U.S. Cl. 252—474 9 Claims

1. A durable catalytic structure capable of catalyzing the reduction of NO_x gases found in the exhaust stream emanating from an internal combustion engine without the generation of undesirable amounts of ammonia comprising a heat resistant metallic substrate having a catalytic alloy of essentially pure nickel base material and copper adherently deposited on at least a part of the surface thereof wherein the weight ratio of the nickel in the nickel base material to copper is about 49 to 1.

4,111,850

ORGANIC PHOTOCONDUCTORS AND METHODS

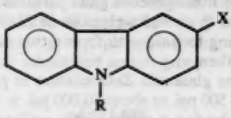
William David Kwalwasser, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 16, 1977, Ser. No. 769,259

Int. Cl.[2] H01C *31/00*

U.S. Cl. 252—501 19 Claims

1. A photoconductive, charge-transfer material comprising a complex of an electron acceptor molecule selected from the group consisting of 2,4,7-trinitro-9-fluorenone and 2,4,5,7-tetranitro-9-fluorenone, with a carbazole compound of the following formula:



wherein R is ethyl and X is nitro.

4,111,851

ELECTRICALLY CONDUCTIVE THERMAL CONTROL COATINGS

Michael Charles Shai, Gambrills, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 21, 1977, Ser. No. 844,344

Int. Cl.[2] H01B *1/08;* C09D *1/02*

U.S. Cl. 252—518 14 Claims

1. A coating characterized by low thermal absorption, high thermal emittance, and high electrical conductivity which comprises:

(a) 70–80 weight percent of an oxide pigment comprising a minor amount of Al_2O_3 and a major amount of ZnO, said pigment being fired at substantially 1175° C. in air for producing a reproducible highly electrically conductive pigment,

(b) 20–30 weight percent of a vehicle-binder comprising an alkali metal silicate, and

(c) sufficient water to provide a mixture suitable for application to a substrate.

4,111,852

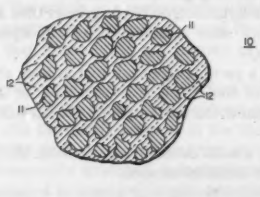
PRE-GLASSING METHOD OF PRODUCING HOMOGENEOUS SINTERED ZNO NON-LINEAR RESISTORS

Shih M. Ho, Wilkinsburg, and Tapan K. Gupta, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1976, Ser. No. 755,774

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—518 6 Claims



1. A method of making a homogeneous, sintered, resistor body, having a substantially uniform density, which can exhibit non-linear V-I characteristics, comprising the steps of:

(A) mixing metallic oxide powders comprising about 10 mole % to about 60 mole % of Bi_2O_3, about 5 mole % to

about 15 mole % of ZnO, about 2 mole % to about 15 mole % of MnO_2, about 2 mole % to about 10 mole % of Co_3O_4, about 5 mole % to about 40 mole % of SiO_2, about 1 to about 15 mole % of B_2O_3 and 0 to about 30 mole % of Sb_2O_3, and melting the mixture at a temperature of between about 1,100° and 1,600° C for a time effective to form a single phase, chemically homogeneous glass melt, and then

(B) quenching the glass melt to form a single phase, chemically homogeneous porous glass, and then

(C) grinding the glass to form fine glass particles, and then

(D) mixing:

(1) 2.5 weight % to 40 weight % of the single phase, chemically homogeneous glass particles with

(2) 60 weight % to 97.5 weight % of ZnO particles, by a spray drying technique to form a two component mixture, and then

(E) pressing the glass and ZnO mixture at pressures of between about 500 psi. to about 40,000 psi. to form a consolidated body having a substantially uniform density, and then

(F) sintering the pressed body, at a temperature of between about 900° and 1,400° C, at a temperature rate increase of between about 75° C/hr. to about 150° C/hr., for 1 to 4 hours, to form a ceramic body consisting of ZnO particles, and a single phase, chemically homogeneous coating formed from the glass and binding the ZnO particles together, wherein the density throughout the mass will vary no more than about 10%, said sintered body exhibiting non-linear V-I characteristics.

4,111,853

PARTICULATE COMPOSITION OF SODIUM ALPHA OLEFIN SULFONATE AND SODIUM SILICATE

Andrew Shultz, Deerfield, and F. Quinn Stepan, Winnetka, both of Ill., assignors to Stepan Chemical Company, Northfield, Ill.

Continuation-in-part of Ser. No. 664,753, Mar. 8, 1976, abandoned. This application Nov. 4, 1977, Ser. No. 848,644

Int. Cl.[2] C11D *1/14, 3/08*

U.S. Cl. 252—536 **4 Claims**

1. A particulate surfactant composition adapted for use as an intermediate in the preparation of synthetic detergent formulations, said composition consists on a 100 weight percent basis of a homogeneous mixture of

(A) from about 25 to 65 weight percent of a sodium silicate having an SiO_2 to Na_2O weight ratio of from about 1:1 to 2.8:1,

(B) from about 25 to 65 weight percent of a sodium alpha olefin sulfonate derived from at least one alpha olefin containing from 14 to 18 carbon atoms per molecule,

(C) from about 0.2 to 2 weight percent of a salt selected from the group consisting of sodium chloride and sodium sulfate, and

(D) from about 4 to 15 weight percent water,

said composition being further characterized by

(a) being in the physical form of a homogeneous, storage-stable, free-flowing group of beads,

(b) having a hygroscopicity not greater than about 5 percent free water after standing in an atmosphere of normal humidity,

(c) having a particle size such that at least about 90 weight percent of such group particles have at least about two dimensions in the size range from about 0.001 to 1 millimeter, and

(d) having a bulk density ranging from about 0.25 to 0.50 gram per milliliter tamped.

said composition having been prepared by spray drying at a temperature ranging from about 220° to 450° F. an aqueous suspension comprised initially on a 100 weight percent total suspension basis of from about 35 to 65 weight percent total solids, and, correspondingly, from about 35 to 65 weight percent water, said solids comprising a composition as above detailed on a 100 weight percent basis.

4,111,854

GENERAL PURPOSE HOUSEHOLD CLEANER

Gianfranco Luigi Spadini, Strambeek-Bever, Belgium, and Emiel Mathilde Anna Alfons Demessemaekers, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 17, 1975, Ser. No. 559,185

Claims priority, application France, Mar. 15, 1974, 74 08994

Int. Cl.[2] C11D *1/02, 1/12, 3/33*

U.S. Cl. 252—541 **7 Claims**

1. A general purpose household cleaning composition comprising in percentage by weight, calculated on the finished product:

(A) from about 3% to about 30% of a water-soluble, organic, anionic, surface-active, detersive sulfuric acid reaction product, selected from the group consisting of paraffin sulfonic acid having from 12 to 22 carbon atoms; alkyl benzene sulfonic acid having from 8 to 18 carbon atoms in the alkyl radical; alkyl sulfuric acid ester, having from 10 to 22 carbon atoms in the alkyl group and having as a cation an alkali-metal, ammonium and substituted ammonium; and mixtures thereof;

(B) from about 2% to about 20% of a lower polypeptide having a molecular weight below 600, and an isoelectric point of at least 5.5, or mixtures thereof, or a protein hydrolysate containing at least 50% by weight, calculated on the hydrolysate, of lower polypeptides having a molecular weight below 600, and an isoelectric point of at least 5.5, containing at most 15% by weight of amino acids and at most 25% by weight of penta- and higher polypeptides; and

(C) the balance a neutral carrier; whereby the weight ratio of (A)/(B) is between about 6/1 to about 1/1.

4,111,855

LIQUID ENZYME CONTAINING DETERGENT COMPOSITION

Christian Roland Barrat, Meise; José Luis Arnau, Wermel, and Jean Wevers, Brussels, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 7, 1977, Ser. No. 775,213

Claims priority, application United Kingdom, Mar. 8, 1976, 9258/76; Dec. 9, 1976, 51465/76

Int. Cl.[2] C11D *1/831, 3/36*

U.S. Cl. 252—545 **6 Claims**

1. An unbuilt enzymatic liquid detergent composition comprising:

(a) from about 35% to about 75% by weight of the composition of a surfactant mixture which is

(i) an ethoxylated nonionic surfactant selected from the group consisting of ethoxylated aliphatic alcohols and ethoxylated alkyl phenols and mixtures thereof, and

(ii) a synthetic anionic surfactant selected from the group consisting of compounds of the formula R_3SO_3M, wherein R_3 represents a hydrocarbyl group selected from the group consisting of straight or branched chain alkyl radicals having from 12 to 24 carbon atoms; and alkyl phenyl radicals having from 9 to 15 carbon atoms in the alkyl group and wherein M is a salt forming cation selection from the group consisting of sodium, potassium, ammonium, and mono-, di-, and trialkanol amines having 2 to 3 carbon atoms in the alkanol group, wherein the weight ratio of said ethoxylated nonionic surfactant to said synthetic anionic surfactant is from about 1:1 to about 5:1;

(b) from about 0.05% to about 1.5% by weight of a polyacid selected from the group consisting of: ethylenediamine tetramethylene phosphonic acid; hexamethylene diamine-tetramethylene phosphonic acid, diethylene triaminepentamethylene phosphonic acid, and aminotrimethylene phosphonic acid;

(c) from 0.5 millimole to 15 millimoles/liter of composition of free calcium ions;

(d) from 0.001% to about 2% by weight of an alkaline proteolytic enzyme having an iso-electric point of greater than about 8; and

(e) the balance of the composition comprising a liquid which is water and a liquid organic solvent which is a lower aliphatic alcohol having from 2 to 6 carbon atoms and 1 to 3 hydrocarbyl groups and mixtures thereof wherein the liquid organic solvent is from about 2% to about 15% by weight of the total composition and wherein the pH of the composition is from about 6.0 to about 7.5.

4,111,856

INSOLUBLE RESIN-METAL COMPOUND COMPLEX PREPARED BY CONTACTING WEAK BASE ION EXCHANGE RESIN WITH SOLUTION OF METAL-LIGAND

Werner O. Haag, Trenton, and Darrell Duayne Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 306,782, Nov. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 860,807, Sep. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 672,010, Oct. 2, 1967, abandoned. This application Aug. 29, 1974, Ser. No. 501,429

Int. Cl.[2] C07C *29/02, 15/00*

U.S. Cl. 521—30 7 Claims

1. A method of making an insoluble resin-metal coordinative complex compound comprising an insoluble weak base anion exchange resin having amine, phosphine, arsine, stibine, thiol or sulfide Lewis base substituents, coordinatively, nonionically bonded through said substituents to metal selected from the group consisting of platinum, palladium, rhodium, ruthenium, osmium, iridium, gold, cadmium, titanium, zirconium, hafnium, vanadium, chromium, molybdenum, tungsten, manganese, rhenium, iron, cobalt, nickel, copper, zinc, silver and mercury which comprises contacting said resin containing said substituents with a solution of a compound of said metal having at least two ligands coordinatively connected to said metal at a PH at which said substituents possess essentially no ion exchange properties and at a temperature below the decomposition temperature of said resin and said metal compound for a time sufficient for at least one of said ligands to be coordinatively exchanged for said Lewis base.

4,111,857

HIGHLY CONDUCTING ORGANOMETALLIC POLYMERS

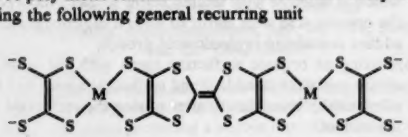
Edward Martin Engler, Wappingers Falls; Kenneth Herbert Nichols, Peekskill; Vishnubhai Vitthalbhai Patel, Ossining; Nilda Martinez Rivera, Peekskill, all of N.Y., and Robert Rhees Schumaker, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,379

Int. Cl.[2] C08G *75/00, 79/00*

U.S. Cl. 528—226 8 Claims

1. A poly metal tetrathiafulvalene tetrathiolate composition having the following general recurring unit



where M is at least one multivalent metal.

4,111,858

PROCESS FOR THE PREPARATION OF POLYHYDROXY METHYLENE ETHERS AND ION EXCHANGERS COMPOSED THEREOF

Michael Kostrzewa, and Karl-Friedrich Mück, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 721,986, Sep. 10, 1976, abandoned. This application Apr. 19, 1977, Ser. No. 788,848

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1975, 2540688

Int. Cl.[2] C08F *16/12, 8/40, 8/30*

U.S. Cl. 521—25 1 Claim

1. An ion exchanger composed of etherified polyhydroxy methylene in which the alkoxy groups carry at least one ionic or ionizable carboxyl group, phospho group, quaternary ammonium group, or substituted amino group.

4,111,859

METHOD OF PREPARATION OF ION EXCHANGERS BY ALKYLATION AND HYDROXYALKYLATION OF POLYMERIC HYDROPHILIC ANION EXCHANGERS

Petr Štrop; Jiří Coupek, and Otakar Mikeš, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Feb. 7, 1975, Ser. No. 548,096

Claims priority, application Czechoslovakia, Feb. 13, 1974, 1029-74

Int. Cl.[2] B01D *15/04;* C08J *5/20;* B01D *15/08*

U.S. Cl. 521—33 4 Claims

1. In the method for forming polymeric anion exchangers from hydrophilic gels formed from acrylate and methacrylate based copolymers having amino groups, the improvement comprising modifying said gels by subjecting said gels to alkylation agents selected from the group consisting of alkyl halides, alkyl p-toluenesulfonates and epoxides.

4,111,860

PROCESS FOR THE PRODUCTIONS OF MULTI-CELLULAR STRETCHED ARTICLES

James Jack, Mistley, England, assignor to Bakelite Xylonite Limited, London, England

Filed Oct. 29, 1974, Ser. No. 518,902

Claims priority, application United Kingdom, Oct. 31, 1973, 50654/73

Int. Cl.[2] B29D *27/00;* C08J *9/00*

U.S. Cl. 521—84 16 Claims

1. A process for the production of a multi-cellular stretched article, which process comprises the steps of forming a composition comprising mixing a melted blend of a stretchable thermoplastic organic polymer matrix and an additive which reduces the density of the resulting article and is non-molten or non-softened in the normal orientation temperature range of the matrix polymer, at a temperature at which the matrix polymer and additive are molten,

forming an article from said composition, and

then stretching the article at a temperature which is within the normal orientation temperature range for the matrix polymer so that micro-voids are formed in the matrix polymer,

said additive constituting from about 2 to 50% by weight of the total weight of the blend, being at least partially incompatible with the matrix polymer in the concentration employed when and at the temperature at which said article is subsequently stretched, being selected from the group consisting of organic polymeric, organic acids, and those metal salts of organic acids other than metal resinates and rosin esters, except when the matrix polymer is a crystallizable polymer other than an olefin, in which case said additive is selected from the group consisting of organic acids and their metal salts other than metal resinates and rosin esters,

the temperature at which said article is stretched being below the glass-transition temperature of said additive when said additive is a polymer, and below the melting or softening point of the additive when said additive is an organic acid, organic derivative or a modified or unmodified natural product.

15. The multicellular stretched article produced by a process as of claim 1.

4,111,861
METHOD OF MOLDING POLYURETHANES HAVING MOLD RELEASE PROPERTIES

Robert Everett Godlewski, Mahopac, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 24, 1976, Ser. No. 726,215
Int. Cl.[2] C08G *18/34;* C08K *3/26, 5/09*
U.S. Cl. 521—123 **5 Claims**

1. A method for producing a polyurethane elastomer which comprises forming in a mold cavity having metal walls and curing a reaction mixture containing:

(a) a polyol,

(b) an organic polyisocyanate in an amount that provides from 0.8 to 1.3 isocyanato groups per active-hydrogen in the reaction mixture,

(c) a catalytic amount of catalyst for curing of the reaction mixture to produce the elastomer, and

(d) as a mold release additive, mixtures of a fatty acid wherein the number of carbon atoms ranges from about 8 to about 35 and a compound selected from the group consisting of sodium carbonate, sodium oleate and potassium laurate.

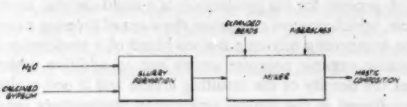
4. A method as claimed in claim 1 for producing a microcellular polyurethane elastomer wherein there is also employed:

(a) a blowing agent in an amount sufficient to produce a microcellular structure in the elastomer.

4,111,862
MASTIC COMPOSITION AND COMPOSITE STRUCTURAL PANELS FORMED THEREFROM

Robert C. Geschwender, Lincoln, Nebr., assignor to Bell Fibre Products Corporation, Marion, Ind.

Continuation of Ser. No. 491,676, Jul. 25, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 665,066
Int. Cl.[2] C08J *9/22*
U.S. Cl. 521—55 **11 Claims**



1. A mastic composition comprising a substantially imporous homogeneous mixture of a predetermined volume of low density expanded closed cell synthetic resin beads and a slurry formed from between about 55% to 65% by weight of calcined gypsum and between 45% to 35% water, the volume of expanded beads having an interstitial volume not substantially more than the volume of the slurry, the volume of the slurry being not more than about 25% in excess of the interstitial volume and being not substantially less than the interstitial volume of the beads, the substantially homogeneous mixture being self-adhering as a thick layer on an inverted smooth surface and yet being separable therefrom as an integral layer, said mastic composition being free of surface active or wetting agents and setting to a hard, strong, dimensionally stable, heat and sound retardant material with the beads being unbonded one to another and to the crystallized gypsum and water.

4,111,863
METHOD OF PREPARING POLYMERS ANALOGOUS TO ENZYMES

Günter Wulff, Bonn, and Ali Sarhan, Ollheim, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 390,824, Aug. 23, 1973, abandoned. This application Apr. 16, 1975, Ser. No. 568,639
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1972, 2242796
U.S. Cl. 521—63 **65 Claims**

1. A non-swellable, three-dimensional polymer having a component which is a residue of an optically active or achiral compound which residue is chemically removable from said polymer to leave behind in the physical structure of said polymer a void corresponding to the size and shape of said residue of optically active or achiral compound, said polymer having recurring units of the formula

wherein

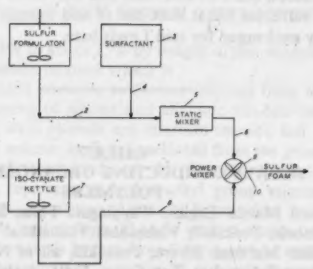
A is a residue, bonded to B, of a compound which residue is polymerizable or polycondensable or polyadditionable

B is a residue of an optically active or achiral compound.

4,111,864
SULFUR FOAM

Gar Lok Woo, Tiburon, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 516,229, Oct. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 438,508, Jan. 31, 1974, Pat. No. 3,887,504, and Ser. No. 344,694, Mar. 26, 1973, Pat. No. 3,892,686, which is a continuation-in-part of Ser. No. 253,144, May 15, 1972, abandoned. This application Jul. 26, 1976, Ser. No. 708,469
The portion of the term of this patent subsequent to Jun. 3, 1992, has been disclaimed.
Int. Cl.[2] C08G *53/08;* C08J *1/22*
U.S. Cl. 521—117 **23 Claims**



1. A process for producing sulfur foam containing at least 50 weight percent sulfur, which comprises:

(a) reacting molten sulfur with an organic protonic acid which is reactive with molten sulfur so as to incorporate the organic acid with sulfur to form a sulfur-organic acid adduct containing protonic acid groups;

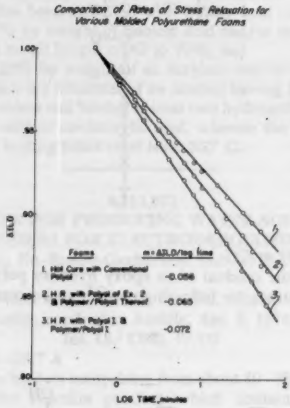
(b) mixing an organic surfactant agent with the adduct to obtain a mixture of adduct and surfactant agent; and then, substantially immediately after mixing the surfactant with the adduct,

(c) reacting the mixture with a polyisocyanate to obtain sulfur foam.

4,111,865
POLYMER/POLYOLS AND POLYURETHANE FORMS AND ELASTOMERS THEREFROM

Carl G. Seefried, Jr.; Robert D. Whitman, and Russell Van Cleve, all of Charleston, assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 523,474, Nov. 13, 1974, abandoned. This application Sep. 27, 1976, Ser. No. 727,221
Int. Cl.[2] C08G *18/14, 18/63;* C09K *3/00;* C08K *5/06*
U.S. Cl. 521—137 13 Claims


Comparison of Rates of Stress Relaxation for Various Molded Polyurethane Foams
Foams
m = ΔS.D/log time
1. Hot Cure with Conventional Polyol
-0.056
2. H R with Polyol of Ex. 2 & Polymer/Polyol Thereof
-0.065
3. H R with Polyol 3. & Polymer/Polyol 3
-0.072
LOG TIME, minutes

1. A polymer/polyol composition consisting essentially of:

A. A major amount of a normally liquid polyoxyalkylene-polyoxyethylene polyol consisting essentially of: (1) polyoxyalkylene blocks that consist of oxyalkylene groups containing at least 3 carbon atoms, (2) polyoxyethylene blocks that consist of oxyethylene groups, that end-block at least 35 mole percent of such polyoxyalkylene blocks and that are terminated with primary hydroxyl groups and (3) the residue of at least one starter, said polyol having: (a) from 90 to 97 weight percent of such polyoxyalkylene blocks and from 10 to 3 weight percent of such polyoxyethylene blocks based on the total weight of such blocks in the polyol, (b) an average of at least 3.2 hydroxyl groups per molecule, (c) a hydroxyl number no greater than 45 and (d) at least 35 mole percent primary hydroxyl groups based on the total moles of hydroxyl groups in the polyol; and

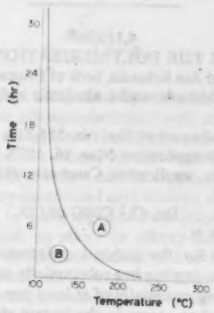
B. A minor amount of a polymer formed by polymerizing at least one ethylenically unsaturated monomer in said polyol by free radical polymerization, said polymer being in the form of particles that are stably dispersed in the polyol.

4,111,866
METHOD OF MAKING A CHEMICAL-RESISTANT DIAPHRAGM THEREOF

Eiichi Torikai, Yao; Youji Kawami, Kawachi-nagano; Shinichiro Kai, Ibaragi; Mutsusuke Namba, and Shuhei Simasaki, both of Settsu, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo and Daikin Kogyo Co., Ltd., Osaka, both of, Japan

Filed Apr. 20, 1977, Ser. No. 789,440
Claims priority, application Japan, Apr. 20, 1976, 51-45931
Int. Cl.[2] C08J *9/26*
U.S. Cl. 521—53 8 Claims

1. A method for the manufacture of a diaphragm excellent in water-permeating property and resistance to chemicals, which method comprises preparing a porous film of a mixture consisting of a fluorine-containing polymer is one member selected from the group consisting of a homopolymer of tetrafluoroethylene copolymers of tetrafluoroethylene and hexafluoropropylene, copolymers of tetrafluoroethylene and perfluorovinyl ether, and copolymers of tetrafluoroethylene and ethylene and at least one member selected from the group consisting of



titanium oxide and titanic acid, immersing said film in an aqueous potassium hydroxide solution of 0.5N - 10N and subsequently heating said film at 100 to 350° for thereby giving birth to potassium titanate within the film.

4,111,867
RUBBER COMPOSITION FOR TIRE TREADS

Keiji Komuro, Yokohama; Tetsu Ohishi, Tokyo; Tetsuo Waku; Nagatoshi Sugi, both of Yokohama; Souichi Suzuki, Tokuyama, and Akio Ueda, Yokohama, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1977, Ser. No. 782,323
Claims priority, application Japan, Apr. 5, 1976, 51-37206; Apr. 14, 1976, 51-42063
Int. Cl.[2] C08L *7/00*
U.S. Cl. 260—5 10 Claims

1. A rubber composition for tire treads, said composition consisting essentially of

(Ia) an oil-extended rubber having a Mooney viscosity (ML_{1+4}, 100° C.) of 20 to 70 and prepared by adding 20 to 80 parts of a hydrocarbon oil to 100 parts by weight of a rubbery terpolymer which is composed of 2 to 13% by weight of combined styrene, 15 to 70% by weight combined of 1,3-butadiene and 17 to 83% by weight of combined 1,3-pentadiene with the dienes having a total 1,4-bond content of at least 65 mole%, has a glass transition temperature of −70° to −20° C., and is produced by emulsion-polymerization at 0° to 30° C.,

(II) vulcanization additives, and

(III) 30 to 110 parts by weight, per 100 parts by weight of the oil-extended rubber (Ia), of a carbon black for rubber having an average particle diameter of not more than 60 mμ.

4,111,868
FIBERED SYNTHETIC CLAY COMPOSITION FOR USE IN AESTHETIC ARTS

Kent L. Ficken, Munjor Rte. Hays, Kans. 67601

Filed Apr. 15, 1977, Ser. No. 787,946
Int. Cl.[2] C08L *3/02*
U.S. Cl. 260—17.4 ST 6 Claims

1. A clay composition mixed in a dry form with water for forming a cohesive and plastic like material for use in construction, sculpturing, arts and crafts and the like, the composition comprising:

powdered gypsum;

marble dust;

nylon fiber present in the amount of .1%–1% of the dry weight of the total composition;

wheat paste present in the amount of 0%–2% of the dry weight of the total composition; and

latex present in the amount of 2%–6% of the dry weight of the total composition.

4,111,869

METHOD FOR THE POLYMERIZATION OF LACTAMS

Rudolf Puffr, and Jan Sebenda, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 551,515, Feb. 21, 1975, abandoned. This application Mar. 16, 1977, Ser. No. 778,003

Claims priority, application Czechoslovakia, Feb. 28, 1974, 1749/74

Int. Cl.[2] **C08G** *69/20*

U.S. Cl. 260—18 N **7 Claims**

1. A process for the cationic polymerization of lactams which comprises: heating in a substantially anhydrous system a mixture consisting essentially of at least one lactam containing from 6 to 16 carbon atoms in the lactam ring, and a catalyst consisting essentially of from about 0.05 to 10 mole percent with respect to the lactam of at least one anhydrous salt of a metal selected from the group consisting of copper, zinc, boron, aluminum, titanium, silicon, vanadium, antimony, bismuth, chromium, molybdenum, tungsten, manganese, iron, cobalt, and nickel and an anion selected from the group consisting of phosphate, pyrophosphate, phosphite, sulfate, halide, carboxylate and sulfonate, and from about 0.05 to 5 mole percent with respect to the lactam of an acid selected from the group consisting of pyrophosphoric, phosphorous, hydrohalic, carboxylic, sulfonic and mixtures thereof, to form a polyamide.

4. The process of claim 1 wherein said salt is selected from the group consisting of tungsten hexachloride, antimony pentachloride, titanium tetrachloride, silicon tetrachloride, aluminum trichloride, aluminum tribromide, boron trifluoride, chromium sulfate, aluminum stearate and mixtures thereof.

4,111,870

PRIMER COMPOSITION OF AN ACRYLIC EPOXY ESTER GRAFT COPOLYMER, A HIGH MOLECULAR WEIGHT EPOXY RESIN AND A HEAT REACTIVE CONDENSATE

Herman Charles Den Hartog, Pontiac, and Aloysius Norbert Walus, Troy, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 24, 1977, Ser. No. 800,066

Int. Cl.[2] **C09D** *3/52, 3/58*

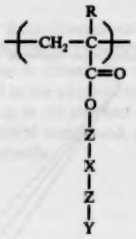
U.S. Cl. 260—21 **15 Claims**

1. A coating composition comprising a solution of 5–60% by weight of film-forming constituents in an organic solvent; wherein the film-forming constituents consist essentially of

(1) 20–85% by weight of an acrylic epoxy ester graft copolymer having a relative viscosity of about 1.040–1.100 measured at 0.5% polymer solids in dichloroethylene solvent at 25° C. and consisting essentially of 10–75% by weight of a polymeric backbone segment and 90–25% by weight of polymer side chain segments; wherein

(a) the polymeric backbone segment of the graft copolymer consists essentially of polymerized monomers selected from the group consisting of methyl methacrylate, styrene and mixtures thereof; and about 0.5–5% by weight, based on the weight of the copolymer, of polymerized methacrylic acid or acrylic acid monomers; and about 0.5–10% by weight, based on the weight of the copolymer, of polymerized adhesion promoting acrylic monomers selected from the group consisting of hydroxyaminopropyl methacrylate, diethylaminoethyl methacrylate, dimethylaminoethyl methacrylate, 2-aminopropyl methacrylate, 2-aminoethyl methacrylate, t-butyl aminoethyl methacrylate, 2-(1-aziridinyl)-ethyl methacrylate, N-2-hydroxypropyl methacrylamide, N-2-hydroxyethyl methacrylamide and 3-(2-methacryloxyethyl)-2,2-spirocyclohexyloxazolidine;

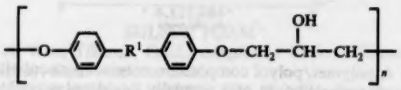
(b) the polymeric side chain segments are grafted into the backbone segment and consist essentially of the following formula which is shown as being grafted into the backbone segment



wherein

R is H or CH_3;

Z is the residual of an epoxy hydroxy polyether resin that has the following recurring structural unit

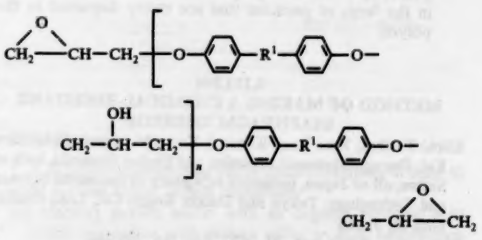


where *n* is a positive integer sufficiently large to provide a weight average molecular weight of 500–4,000 and R^1 is an alkylene group;

X is the residual of a dimer dicarboxylic fatty acid in which the carboxyl groups of the fatty acid are reacted with terminal epoxy groups of th expoxy hydroxy polyether resin; and

Y is the residual of an aromatic, cycloaliphatic or aliphatic monocarboxylic acid in which the carboxyl group is reacted with a terminal epoxy group of the epoxy hydroxy polyether resin;

(2) 5–70% by weight of an epoxy hydroxy polyether resin of the formula



where R^1 is an alkylene group and *n* is an integer sufficiently large to provide a weight average molecular weight of about 30,000–200,000; and

(3) 10–35% by weight of a heat reactive condensate selected from the group consisting of an alkylated melamine formaldehyde, an alkylated urea formaldehyde, an alkylated benzoguanamine formaldehyde or mixtures thereof wherein the alkyl groups have 1–4 carbon atoms.

4,111,871

OIL-MODIFIED ALKYD RESIN COMPOSITION

Mitsutoshi Aritomi, Ibaraki, Japan, assignor to Mitsubishi Petrochemical Company Limited, Japan

Filed Apr. 15, 1977, Ser. No. 787,962
Claims priority, application Japan, Apr. 19, 1976, 51-44317; Dec. 2, 1976, 51-143961
Int. Cl.[2] C09D *3/64, 3/66*
U.S. Cl. 260—22 CB 15 Claims

1. An oil-modified alkyd resin composition substantially free of solvent comprising:

(A) 50 to 80% by weight of an oil-modified alkyd resin which has been modified with a fatty acid containing at least 65% by weight of linoleic acid and/or linolenic acid and has an oil length of 40 to 70%; and

(B) 50 to 20% by weight of an acrylate and/or methyacrylate which is a monester of an alcohol having from 2 to 20 carbon atoms and having at least two hydroxyl groups and acrylic acid or methacrylic acid, wherein the component B has a boiling point of at least 200° C.

4,111,872

PROCESS FOR PRODUCING WATER-SOLUBLE BINDERS FOR ELECTRODEPOSITION

Gert Dworak, Dr.-Robert-Grafstrasse 25/9/59/60, 8010 Graz, Austria

Filed Mar. 25, 1975, Ser. No. 561,798
Claims priority, application Austria, Apr. 3, 1974, 2789/74
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23.7 A 19 Claims

1. Aqueous binders comprising from about 80 - 98 percent by weight of the reaction product which contains carboxyl groups or latent carboxyl groups of

(A) from about 70 to 90 percent by weight of a diene polymer having a molecular weight of from about 500 to 5,000, and

(B) from about 10 to 30 percent by weight of an alpha,beta-ethylenically unsaturated carboxylic acid or derivative thereof, and

wherein from about 5 to 70 percent of the carboxyl groups or latent carboxyl groups of (A) and (B) are esterified with a monoalcohol; and from about 2 – 20 percent by weight of a resinous polycarboxylic acid having an acid number of from about 150 to 350 mg KOH/g, jointly neutralized to the water-soluble form with a base material.

11. Process for producing aqueous binders comprising polydiene adducts wherein

(A) from about 70 - 90 percent by weight of a diene polymer having a molecular weight of from about 500 to 5,000, and

(B) from about 10 - 30 percent by weight of an alpha,beta-ethylenically unsaturated carboxylic acid or derivative thereof,

are reacted completely at 150° – 250° C. to form an adduct containing carboxyl or latent carboxyl groups, and from about 5 – 70 percent by weight of the carboxyl groups or latent carboxyl groups thereof are esterified with a monoalcohol to form a partially esterified adduct, and thereafter from about 80 – 98 percent by weight of said partially esterified adduct, and from about 2 – 20 percent by weight of a resinous polycarboxylic acid having an acid number of from about 150 to 350 mg KOH/g are jointly neutralized with a base to provide water solubility.

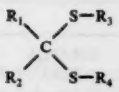
4,111,873

HEAT STABILIZED HALOGEN-CONTAINING POLYMERS

William Frederick Cordes, III, East Brunswick, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 7, 1976, Ser. No. 693,468
Int. Cl.[2] C08K *5/37, 5/36*
U.S. Cl. 260—23 XA 26 Claims

1. A thermally stable composition comprising a halogen-containing polymer selected from the group consisting of homopolymers and copolymers of vinyl chloride, vinylidene chloride or chlorinated polyolefins and an effective stabilizing amount of a combination of (a) a compound of the formula:



wherein R_1 and R_2 are independently selected from hydrogen, alkyl, aryl, alkyl- or alkoxy-substituted aryl, aralkyl, alkyl- or alkoxy-substituted aralkyl, or taken together form an alkylene radical of 3 to 9 carbon atoms; R_3 and R_4 are independently selected from alkyl of at least 4 carbon atoms; carbalkoxyalkyl, aryl, alkyl- or alkoxy-substituted aryl, aralkyl, alkyl- or alkoxy-substituted aralkyl, or taken together form thiodimethylene, an ortho-arylene radical, an alkyl- or alkoxy-substituted ortho-arylene radical, or an alkylene radical of 2 to 4 carbon atoms, and (b) a divalent metal salt selected from magnesium, calcium, barium or zinc stearate, laurate, oleate or benzoate, or mixtures thereof.

4,111,874

TRANSPARENT PRESSURE-SENSITIVE COATINGS

Frederick W. Meadus; Bryan D. Sparks, and Ira E. Puddington, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Oct. 4, 1976, Ser. No. 729,292
Int. Cl.[2] C08L *29/04, 31/04, 91/00*
U.S. Cl. 260—23 R 12 Claims

1. An aqueous composition which on drying on a substrate forms a pressure-sensitive transparent coating, the composition comprising

(a) a fatty acid soap, the fatty acid being saturated and having from 16 to 18 carbon atoms, and having a cation selected from the group consisting of sodium, potassium and ammonium, the soap being in the form of fine transparent particles,

(b) water, in an amount sufficient to dissolve said fatty acid soap, and

(c) a non-waxy binder selected from the group consisting of vinyl acetate polymers, acrylic polymers, and mixtures thereof.

4,111,875

COMPOSITION OF HEEL BASE FOR SHOES

Pasquale A. Uva, 248 South St., Holbrook, Mass. 02343

Filed Feb. 20, 1976, Ser. No. 659,683
Int. Cl.[2] C08K *5/10*
U.S. Cl. 260—23 R 11 Claims

1. A heel base having a pair of opposed faces and a plurality of edges,

(a) said heel base being of a composition consisting essentially of the following ingredients:

	% by Total Weight
ethylene vinyl acetate copolymer	8 to 85
ethylene homopolymer	5 to 25
processing lubricant	0 to 2
filler	10 to 60
internal lubricant	1 to 5
desiccant	1 to 25

(b) said ethylene vinyl acetate copolymer and said ethylene homopolymer, based on their own weight, including from 15 to 30% ethylene vinyl acetate copolymer and from 85 to 70% ethylene homopolymer;

(c) said desiccant weighing at least three times the available free moisture of said composition;

(d) one of said pair of opposed faces being adapted for affixation to a portion associated with a shoe upper; and

(e) the other of said pair of opposed faces being mechanically rough and chemically active for enhanced bonding by an adhesive to a heel.

4,111,876

IMPACT MODIFIERS FOR POLYVINYL CHLORIDE

Frederick Eugene Bailey, and Joseph Victor Koleske, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,973
Int. Cl.[2] C08L *25/12, 27/06, 25/14, 35/06*
U.S. Cl. 260—29.6 RB 6 Claims

1. A poly(vinyl chloride) resin composition comprised of an admixture of poly(vinyl chloride) resin and a clear or translucent polymeric material comprised of a non-uniform copolymer of acrylonitrile, styrene, and acrylate, said mixture containing from 3 to 15 percent by weight based on said admixture, of said clear or translucent polymeric material having a weight ratio of an acrylonitrile-styrene hard matrix to an acrylonitrile-styrene-acrylate elastomer segment which is between about 40 to 60 and about 60 to 40, and said nonuniform polymer having been prepared by the process which comprises: introducing at least one primary polymerizable feed composition, selected from the group of monomers consisting of styrene, acrylonitrile, acrylate and a mixture of two or more such monomers, from at least one primary feed source to a polymerization zone, said primary polymerizable feed composition continually varying in compositional content of the polymerizable reactants therein during said continuous introduction; simultaneously adding to said primary feed source at least one different secondary polymerizable feed composition, selected from the group of monomers consisting of styrene, acrylonitrile, acrylate and a mixture of two or more of such monomers, from at least one secondary feed source so as to continually change the compositional content of the polymerizable reactants of said primary polymerizable feed composition in said primary feed source; and continuously polymerizing the primary polymerizable feed composition introduced to the polymerization zone until the desired polymerization has been achieved, said primary polymerizable feed composition being different from said secondary polymerizable feed composition.

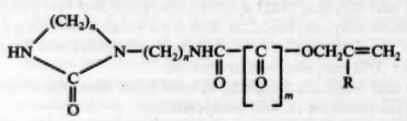
4,111,877

ALLYL ESTERS OF N-ALKYL-OMEGA-(ALKYLENEUREIDO) AMIC ACIDS AND THEIR SYNTHESIS AND USE IN AQUEOUS EMULSION POLYMER SYSTEMS

Dale D. Dixon, Kutztown, and Frederick L. Herman, Allentown, both of Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Jul. 29, 1976, Ser. No. 709,677
Int. Cl.[2] C08L *39/04*
U.S. Cl. 260—29.6 R 20 Claims

1. Compounds corresponding to the structural formula



wherein *m* is zero or one, *n* is two or three, and R is H or CH_3.

4,111,878

WATER BASED INK COMPOSITION FOR VINYL FLOORING

Truman J. Ruhf, Emmaus, Pa., assignor to GAF Corporation, New York, N.Y.

Filed Aug. 5, 1976, Ser. No. 712,086
Int. Cl.[2] C09D *3/80*
U.S. Cl. 260—29.6 ME 6 Claims

1. A water-based printing ink composition comprising:
(a) a blend of acrylic latex selected from the group consisting of polymers and copolymers of acrylic acid, methacrylic acid, methyl methacrylate, methyl acrylate, ethyl acrylate, ethyl methacrylate and vinyl latex selected from the group consisting of polymers and copolymers of vinyl acetate and vinyl chloride, such latex blend containing between about 20% and about 40% acrylic latex based on such blend;
(b) At least about 5 wt % based upon said latex blend of coalescing agent selected from the group consisting of ethylene glycol monobutylether, propylene glycol, glycerine, hexylene glycol, diethylene glycol monoethyl ether, ethylene glycol and ethylene glycol monobutyl ether acetate;
(c) between about 30 and about 80 wt % water based on total ink composition;
(d) between about 1 and about 5 wt % surfactant based on total ink composition; and
(e) between about 10 and about 50 wt % pigment based on solids in the ink composition.

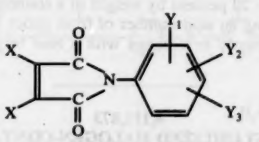
4,111,879

COMPOSITION FOR INHIBITING ADHESION OF SHELLFISH AND ALGAE

Kogoro Mori, Shimizu; Taro Izawa; Yoshifumi Mizuno, both of Shizuoka, and Sadayoshi Matsui, Shimizu, all of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1976, Ser. No. 736,339
Claims priority, application Japan, Jul. 10, 1976, 51-81476
Int. Cl.[2] C09D *5/14, 5/16*
U.S. Cl. 260—29.6 N 2 Claims

1. A method of inhibiting adhesion of shellfish and algae on a fish net or a ship bottom or an apparatus in water which comprises coating thereon a composition comprising a resin, a medium and from 5-80 wt.% thereof of a N-aryl-maleimide having the formula:



wherein X represents hydrogen or halogen atom; Y_1 represents hydrogen or halogen atom or alkyl, lower alkoxy, nitro, hydroxyl, alkoxycarbonyl, carboxyl, phenyl, phenylamino, alkenyl, thiocyano, sulfone, acetylamino or sulfamoyl group; Y_2 represents hydrogen or halogen atom or alkyl, lower alkoxy, nitro or hydroxyl group and Y_3 represents hydrogen or halogen atom or dialkylamino group.

4,111,880

AQUEOUS ADHESION ASSISTANT DISPERSION FOR PRODUCING COMPOSITE BODIES BY VULCANIZATION

Henning Abendroth, Dusseldorf; Joachim Galinke, Langenfeld, and Norbert Wiemers, Monheim-Baumberg, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 28, 1977, Ser. No. 855,175

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654352

Int. Cl.[2] C09J 3/12

U.S. Cl. 260—29.6 MP 16 Claims

1. An aqueous adhesion assistant or binder dispersion for use in the production of composite bodies by vulcanizing a vulcanizable rubber composition on a substrate which is stable under vulcanization conditions comprising water and at least one dispersing agent and a solids content of from 20% to 50% by weight of a solids composition of per

(a) 100 parts by weight of an organic oligomeric to polymeric film-former,

(b) from 5 to 100 parts by weight of an aromatic poly-C-nitroso compound,

(c) from 5 to 100 parts by weight of a phosphorus-containing compound selected from the group consisting of an organic phosphonic acid, a compound producing an organic phosphonic acid under vulcanization conditions, a phosphoric acid partial ester, and a compound producing a phosphoric acid partial ester under vulcanization conditions, and

(d) from 0 to 200 parts by weight of customary fillers and pigments having an improving effect on the vulcanized bond.

4,111,881

POLYOXYHYDROCARBYLENE DIHYDROCARBYL ETHERS AS COALESCING AGENTS FOR SYNTHETIC POLYMER LATEXES

George A. Paul, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 1, 1977, Ser. No. 829,688

Int. Cl.[2] C09D 3/74, 3/80

U.S. Cl. 260—29.6 E 15 Claims

1. An aqueous coating composition comprising a latex of a normally solid thermoplastic organic addition polymer and a coalescing amount of a polyoxyhydrocarbylene dihydrocarbyl ether represented by the formula:

$$R_1—O—R_2O—_nR_1$$

wherein each R_1 is independently a hydrocarbyl group having between about 1 and about 8 carbon atoms, each R_2 is individually an aliphatic hydrocarbylene having between about 2 and about 4 carbon atoms and n is a whole number from 1 to about 4.

4,111,882

FLAME RETARDANT PLASTICIZER FORMULATION FOR POLYVINYL CHLORIDE CONTAINING DIMETHYL METHYLPHOSPHONATE FOR HAZE REDUCTION

John H. Deatcher, Lake Peekskill, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 17, 1976, Ser. No. 724,424

Int. Cl.[2] C08K 5/49; C09K 3/28

U.S. Cl. 260—30.6 R 16 Claims

1. An improved flame retardant, plasticizer formulation comprising a polyvinyl chloride compatible plasticizer and a haloalkyl phosphate flame retardant, said formulation being adapted to be added to polyvinyl chloride polymers, wherein the improvement comprises an effective amount of dimethyl methylphosphonate for reduction of haze when the formulation is added to said polyvinyl chloride polymers.

4,111,883

PLASTICIZED POLYCARBONATE COMPOSITION

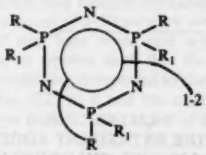
Victor Mark, Evansville, Ind., and Phillip Steven Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 16, 1976, Ser. No. 751,459

Int. Cl.[2] C08K 5/49

U.S. Cl. 260—30.6 R 11 Claims

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of a cyclic phosphazene of the following formula:



I.

R and R_1 are independently selected from the group consisting of C_1 to C_{30} alkyl; C_1 to C_{30} alkoxy; aryl of 6 to 14 carbon atoms; substituted aryl wherein the substituents are selected from one or more halogen, C_1 to C_{30} alkyl or C_1 to C_{30} alkoxy; aryloxy of 6 to 14 carbon atoms; substituted aryloxy wherein the substituents are selected from one or more halogen, C_1-C_{30} alkyl, and C_1-C_{30} alkoxy; alkylthio of 1 to 30 carbon atoms; arylthio of 6 to 14 carbon atoms; substituted arylthio wherein the substituents are selected from one or more halogen, C_1 to C_{30} alkyl, and C_1 to C_{30} alkoxy; —NR_2R_3 wherein R_2 and R_3 are independently selected from hydrogen; C_1 to C_{30} alkyl; aryl of 6 to 14 carbon atoms; substituted aryl wherein the substituents are selected from one or more halogen, C_1 to C_{30} alkyl, C_1 to C_{30} alkoxy, with the proviso that at least one of R_2 or R_3 is other than hydrogen; halogen; with the proviso that at least one of R or R_1 is other than halogen.

7. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of a linear polymeric phosphazene of the formula:

wherein R and R_1 are independently selected from the group consisting of C_1 to C_{30} alkyl; C_1 to C_{30} alkoxy; aryl of 6 to 14 carbon atoms; substituted aryl wherein the substituents are selected from one or more halogen, C_1 to C_{30} alkyl or C_1 to C_{30} alkoxy; aryloxy of 6 to 14 carbon atoms; substituted aryloxy wherein the substituents are selected from one or more halogen, C_1-C_{30} alkyl, and C_1-C_{30} alkoxy; alkylthio of 1 to 30 carbon atoms; arylthio of 6 to 14 carbon atoms; substituted arylthio wherein the substituents are selected from one or more halogen, C_1 to C_{30} alkyl, and C_1 to C_{30} alkoxy; —NR_2R_3 wherein R_2 and R_3 are independently selected from hydrogen; C_1 to C_{30} alkyl; aryl of 6 to 14 carbon atoms; substituted aryl wherein the substituents are selected from one or more halogen, C_1 to C_{30} alkyl, C_1 to C_{30} alkoxy, with the proviso that at least one of R_2 or R_3 is other than hydrogen; with the proviso that at least one of R_1 is other than halogen; n is an integer of from 3 to about 50,000.

4,111,884

ANTICORROSION PRIMER COATING COMPOSITION

Katsuji Takase; Toshimoto Tsuji; Jun-ichi Fukuda, all of Yokohama, and Yasuchika Hiyamori, Kamakura, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Kamakura, Japan

Filed Apr. 6, 1977, Ser. No. 785,216

Claims priority, application Japan, Apr. 19, 1976, 51-45909; Nov. 11, 1976, 51-134634; Feb. 15, 1977, 52-15233; Feb. 16, 1977, 52-15729

Int. Cl.[2] C08K *3/10, 3/32*

U.S. Cl. 260—30.6 R 12 Claims

1. An anticorrosion primer coating composition comprising (1) 100 parts by weight of a polyvinyl butyral resin (2), 20 to 350 parts by weight of a mixture of a borate compound and molybdate or polyphosphate compound wherein the mixing weight ratio is in the range of from 1.9 to 9.1 and (3), 5 to 50 parts by weight of phosphoric acid.

4,111,885

SYNERGISTIC FIRE RETARDANT ADDITIVES FOR PLASTICIZED POLYVINYL CHLORIDE CONSISTING ESSENTIAL OF BORIC ACID AND ZINC OXIDE OR ZINC PHOSPHATE

Ismat A. Abu-Isa, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1977, Ser. No. 818,439

Int. Cl.[2] C08J *3/18;* C08K *3/22, 5/09*

U.S. Cl. 260—31.8 R 3 Claims

1. A fire retardant plasticized polyvinyl chloride composition comprising polyvinyl chloride resin, an aliphatic dicarboxylic acid ester plasticizer, and a fire retarding additive mixed therewith, said additive consisting essentially of boric acid and a component selected from the group consisting of zinc oxide and zinc phosphate, said boric acid and said component being added in such relative amounts that the fire retarding effect provided to the composition thereby is greater as measured by the limiting oxygen index determined by ASTM D2863 than the sum of the fire retarding effects provided by each component alone to a like composition of said polyvinyl chloride resin and said plasticizer.

4,111,886

PLASTICS COMPOSITIONS WITH HIGHER ALCOHOL ESTERS AS LUBRICANTS AND RELEASE AGENTS

Robert Arthur Lindner, Newburgh, N.Y., and Robert James Limon, Bayonne, N.J., assignors to Henkel Inc., Teaneck, N.J.

Filed Feb. 27, 1978, Ser. No. 881,648

Int. Cl.[2] C08K *5/11, 5/12*

U.S. Cl. 260—31.8 T 16 Claims

1. A plastic composition with an improved external lubricant comprising (a) a polymer selected from the group consisting of phenoplasts and chlorine-containing thermoplastic polymers and (b) a calcium salt of a monoalkyl ester of a dicarboxylic acid where said monoalkyl contains more than 18 but less than 72 carbon atoms and said dicarboxylic acid is selected from the group consisting of succinic acid, glutaric acid, phthalic acid, terephthalic acid and isophthalic acid, where the proportion by weight of said calcium salt to said polymer is from 0.05 to 10.0:100.

4,111,887

REINFORCED POLYOXYMETHYLENE MOLDING COMPOSITION CAPABLE OF FORMING COMPOSITE ARTICLES EXHIBITING IMPROVED PHYSICAL PROPERTIES

Jay R. Shaner, Plainfield, N.J., and Robert Edelman, Staten Island, N.Y., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 751,850, Dec. 17, 1976, abandoned. This application Oct. 28, 1977, Ser. No. 846,663

Int. Cl.[2] C08L *71/02*

U.S. Cl. 260—37 AL 20 Claims

1. An improved fiber reinforced polyoxymethylene molding composition capable of forming composite articles exhibiting improved physical properties comprising an admixture of (1) a polyoxymethylene polymer, (2) about 2 to 60 percent by weight based on the total weight of the composition of a fibrous reinforcement, and (3) about 0.5 to 5 percent by weight based on the total weight of the composition of a polycarbodiimide which is (a) derived from an aromatic isocyanate which is unsubstituted or substituted with up to one methyl group per aromatic ring and (b) contains at least three carbodiimide units per polycarbodiimide molecule.

4,111,888

PLASTICIZED POLYMERS OF VINYL ACETATE

Frank Lamb, Oldham; Malcolm Combey, Mellor, and Hugh Melvin Cooper, Cheadle, all of England, assignors to Ciba Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 406,175, Oct. 12, 1973, abandoned, and a continuation-in-part of Ser. No. 192,625, Oct. 26, 1971, abandoned. This application Aug. 7, 1975, Ser. No. 602,888

The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.

Int. Cl.[2] C08K *5/12;* C08F *118/08*

U.S. Cl. 260—31.6 6 Claims

1. A composition consisting essentially of a vinyl acetate polymer selected from the group consisting of homopolymers of vinyl acetate and copolymers of vinyl acetate with one or more ethylenically unsaturated non-halogenated comonomers wherein the proportion of vinyl acetate in the copolymer is 55–100%, and from 10 to 100% by weight based on the weight of the polymer of a polyester having a molecular weight of 350 to 1500 derived from the reaction of a phthalic acid or anhydride or a mixture thereof with a polyethylene glycol having a molecular weight of 175 to 225, and an aliphatic alcohol containing from 3 to 6 carbon atoms; the phthalic acid or anhydride or mixture thereof being reacted with theoretical amounts of alcohol and glycol needed to effect the reaction with the proviso that the alcohol may be reacted in amounts ranging from 0–50% below the amounts necessary to effect the reaction up to 20 mol% in excess of the amount needed to produce the final product and the glycol may be reacted with the phthalic acid or phthalic acid anhydride or mixture thereof in amounts ranging from 0–10 mol % below the theoretical amount necessary to effect the reaction up to 20 mol % in excess of the theoretical amount.

4,111,889

PLASTICIZED HALOGEN CONTAINING RIGID RESIN COMPOSITION

Akira Kaneko; Ichiroh Ishibashi, and Eisyo Nakano, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1976, Ser. No. 687,766

Claims priority, application Japan, May 20, 1975, 50-59209

Int. Cl.[2] C08K *5/12, 5/13*

U.S. Cl. 260—31.8 M 5 Claims

1. A halogen containing rigid resin composition containing 100 parts by weight of a halogen containing resin, an effective amount of heat stabilizer and 0.1 to 2.0 parts by weight of a

dibasic acid-higher alcohol ester represented by a general formula:

$$ROOC(X)COOR'$$

where

X denotes a divalent saturated hydrocarbon group of C_2 to C_8, R denotes a monovalent saturated hydrocarbon group of C_{12} to C_{32} R′ denotes a monovalent saturated hydrocarbon group of C_{12} to C_{32}.

4,111,890

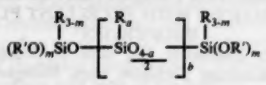
CURABLE ORGANOPOLYSILOXANE COMPOSITIONS CONTAINING TITANIUM ESTERS

John C. Getson, and Wendell L. Johnson, both of Adrian, Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Filed Dec. 19, 1977, Ser. No. 861,769
Int. Cl.² C08L *83/06*
U.S. Cl. 260—37 SB **20 Claims**

1. An organopolysiloxane composition which is stable under anhydrous conditions but when exposed to atmospheric moisture cures to an elastomeric solid at room temperature comprising

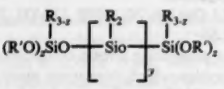
(1) an organopolysiloxane of the formula



(2) an organosilicon compound selected from the group consisting of silanes of the formula

$$R''_n Si(OR')_{4-n}$$

and siloxanes of the formula



and (3) a titanium compound of the formula

$$Ti(OR')_4$$

and hydrolyzates thereof in which R is selected from the group consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and cyanoalkyl radicals, R′ is an aliphatic hydrocarbon radical having up to 10 carbon atoms, R″ is selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, *a* has an average value of from 1.9 to 2.0, *b* has a value greater than 10, *m* has a value of at least 1, *n* has a value of 0, 1 or 2, *y* has a value of from 0 to 10 and *z* has a value of 1, 2 or 3, with the proviso that the R′ radicals in the siloxane, the organosilicon compound and the titanium compound must be identical.

17. The composition of claim 1, which includes a hydrophobic filler.

4,111,891

FRICTION MATERIAL FOR RAILROAD DISC BRAKES

Harold John Reynolds, Jr., Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Nov. 12, 1976, Ser. No. 741,263
Int. Cl.² C08K *3/04, 3/34, 7/12*
U.S. Cl. 260—38 **16 Claims**

1. A friction material useful as a brake shoe for railroad disc brakes which comprises, in parts by weight:

phenolic resin binder: 25–35 parts
carbonaceous component: 2–12 parts
asbestos fiber: 35–50 parts
silicon carbide: 0.4–3 parts

4,111,892

REINFORCED FIRE RETARDANT RESIN COMPOSITION IMPROVED IN ELECTRICAL CHARACTERISTICS

Kazumasa Kamada, and Masafumi Hongo, both of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 18, 1977, Ser. No. 797,819
Claims priority, application Japan, May 24, 1976, 51-59792; Sep. 14, 1976, 51-110206
Int. Cl.² C08K *3/20, 3/36, 5/02*
U.S. Cl. 260—40 R **10 Claims**

1. A reinforced fire retardant resin composition of improved electrical characteristics, which comprises:

a base resin of polytetramethylene terephthalate alone or in admixture with at least one other polymer, a fire retardant combination of a halogen containing compound and an antimony compound, hydrated silica and a reinforcing filler, wherein said halogen containing compound is present in an amount of 3–50 parts by weight per 100 parts by weight of said base resin, said antimony compound is present in an amount such that the weight ratio of the halogen containing compound to the antimony compound ranges from 0.25 to 6 and the content of said hydrated silica ranges from 0.5 – 10 wt. % of the total resin composition.

4,111,893

POLYBUTYLENE TEREPHTHALATE MOLDING RESIN

Robert C. Gasman, W. Milford, and John J. Charles, Bloomingdale, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 798,808
Int. Cl.² C08K *9/06*
U.S. Cl. 260—40 R **16 Claims**

1. A molding resin composition comprising an intimate blend of polybutylene terephthalate having an intrinsic viscosity between about 0.5 and about 1.5 deciliters per gram with mineral filler, individual particles of said mineral filler being coated with sulfonyl azido alkyl trimethoxy silane.

4,111,894

MULTICOMPONENT HALOGENATED THERMOPLASTIC-BLOCK COPOLYMER-POLYMER BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 794,210, May 5, 1977, Pat. No. 4,080,357, which is a continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 864,406
Int. Cl.² C08L *67/00*
U.S. Cl. 260—40 R **18 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of at least one dissimilar engineering thermoplastic, and a fluorinated thermoplastic polymer in a weight ratio of fluorinated polymer to dissimilar engineering thermoplastic of greater than 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

(a) said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000;

(b) said fluorinated thermoplastic polymer has a generally

crystalline structure and a melting point over about 120° C; and

(c) said dissimilar engineering thermoplastic resin is capable of forming a continuous structure and is selected from the group consisting of polyamides, polyolefins, thermoplastic polyesters, polycarbonates, thermoplastic polyurethanes, and nitrile barrier resins.

4,111,895

MULTICOMPONENT POLYCARBONATE-BLOCK COPOLYMER-POLYMER BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application May 5, 1977, Ser. No. 794,198

Int. Cl.² C08K *7/14;* **C08L** *51/00, 53/00*

U.S. Cl. 260—42.18 **19 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of at least one dissimilar engineering thermoplastic, and a polycarbonate in a weight ratio of polycarbonate to dissimilar engineering thermoplastic of greater than 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

(a) said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000 and each polymer block B having an average molecular weight of between about 10,000 and about 300,000;

(b) said polycarbonate has a melting point over about 120° C; and

(c) said dissimilar engineering thermoplastic resin is capable of forming a continuous structure and is selected from the group consisting of polyamides, polyolefins, thermoplastic polyesters, poly(aryl ethers), poly(aryl sulfones), acetal resins, thermoplastic polyurethanes, halogenated thermoplastics, and nitrile barrier resins.

4,111,896

MULTICOMPONENT NITRILE RESIN-BLOCK COPOLYMER-POLYMER BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application May 5, 1977, Ser. No. 794,202

Int. Cl.² C08K *7/14;* **C08L** *51/00, 53/00*

U.S. Cl. 260—42.18 **14 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of at least one dissimilar engineering thermoplastic, and a nitrile barrier resin in a weight ratio of nitrile barrier resin to dissimilar engineering thermoplastic of greater than 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

(a) said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000;

(b) said nitrile barrier resin has an alpha, beta-olefinically unsaturated mononitrile content of greater than 50%, a generally crystalline structure, and a melting point over about 120° C.; and

said dissimilar engineering thermoplastic resin is capable of forming a continuous structure and is selected from the group consisting of poly(aryl ethers), poly(aryl sulfones), polycarbonates and acetat resins.

4,111,897

EPDM COMPOSITION

Arthur Leroy Black, Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 31, 1977, Ser. No. 846,864

Int. Cl.² C08K *3/04, 5/37*

U.S. Cl. 260—42.33 **16 Claims**

1. A composition comprising (a) an elastomeric copolymer of ethylene, a higher α-olefin, and a polyene, (b) at least 25 parts by weight of carbon black, and (c) at least 0.1 part by weight of at least one compound selected from the group consisting of pentachlorothiophenol and the metal salts of pentachlorothiophenol wherein (b) and (c) are each based on 100 parts by weight of said copolymer.

4,111,898

PROCESS FOR PRODUCTION OF RESIN COMPOSITIONS WITH EXCELLENT PLATING PROPERTIES

Akio Inayoshi; Toshimichi Ito, both of Sodegaura; Kikuo Nagatoshi, Kisarazu; Toshihide Nara, Sodegaura; Shinsuke Sagata, Sodegaura; Hitomi Tomari, Sodegaura; Noriki Fujimoto, Sodegaura, and Hidehiko Kaji, Sodegaura, all of Japan, assignors to Idemitsu Kosan Company, Ltd., Tokyo, Japan

Filed Oct. 26, 1977, Ser. No. 845,537

Claims priority, application Japan, Oct. 30, 1976, 51-130039; Oct. 30, 1976, 51-130040

Int. Cl.² C08J *3/20;* **C08F** *255/00, 279/02*

U.S. Cl. 260—42.53 **5 Claims**

1. A process for producing a resin composition having excellent plating properties which comprises mixing a charge consisting essentially of 100 parts by weight of a polyolefin resin, from 5 to 150 parts by weight of an inorganic filler, from 1 to less than 20 parts by weight of a liquid rubber, from 0.1 to 10 parts by weight of an unsaturated carboxylic acid and from 0.001 to 10 parts by weight of a radical generator with heating at a temperature of from 110° C. to 280° C. in the absence of solvents.

4,111,899

HEAT STABILIZED THERMOPLASTIC RESINS CONTAINING COMPOUNDS WITH PHOSPHORUS TO PHOSPHORUS BONDS

Joseph M. Baggett, Freeport, and George E. Ham, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 20, 1977, Ser. No. 817,326

Int. Cl.² C08K *5/50, 5/52, 5/53*

U.S. Cl. 260—45.8 R **10 Claims**

1. A composition which comprises a thermoplastic polymer and a stabilizing amount of a compound having one of the formulas

$$(R_1)(R_2)P(=X)_1-P(=X)_a(R_1)(R_2) \quad \text{I}$$

$$(P-R_1)_n \quad \text{II}$$

$$(R_1)(R_2)P(=X)_a-P(R_3)-P(=X)_a(R_1)(R_2) \quad \text{III}$$

wherein a is independently 0 or 1, n is 3 to 6, X is oxygen or sulfur, R_1, R_2, and R_3 are independently dialkylamino, alkoxy, aryloxy, alkyl, aryl, alkaryl, aralkyl, or R_1 and R_2 taken with the P atom represent a cyclic structure having only carbon, phosphorus and oxygen atoms in the cyclic structure.

4,111,900

BROMINE-CONTAINING PHOSPHINIC ACID ESTERS AND FLAME-RESISTANT PLASTIC MOLDING COMPOSITIONS

Siegfried Noetzel, Kelkheim, Taunus; Horst Jastrow, Niederhöchstadt, Taunus, and Rudolf Uebe, Hofheim, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 17, 1976, Ser. No. 724,252

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1975, 2542009

Int. Cl.[2] C07F 9/32

U.S. Cl. 260—45.7 P 6 Claims

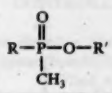
1. Bromine-containing phosphinic acid esters of the formula

wherein

R represents 1,2-dibromoethyl and

R′ represents 2,4,6-tribromophenyl or 2,4,6-trichlorophenyl.

2. A flame-resistant plastic molding composition containing as a flame-proofing agent from 0.3 to 10% by weight, based on the weight of the plastic composition, of a bromine-containing organic phosphinic acid ester of the formula



in which R is selected from linear and branched, bromine-containing aliphatic hydrocarbon radicals of 2 to 12 carbon atoms which may contain a double bond, and bromine-containing cycloaliphatic hydrocarbon radicals of 4 to 10 carbon atoms which may be alkyl-substituted and may contain a double bond, and R′ is selected from bromine-substituted, linear and branched alkyl groups of 2 to 12 carbon atoms and halogen-substituted cycloaliphatic and aromatic hydrocarbon radicals of 6 to 12 carbon atoms which may be alkyl-substituted.

4,111,901

HINDERED FIVE-MEMBERED NITROGEN RINGS AS POLYOLEFIN STABILIZERS

Ingenuin Hechenbleikner, West Cornwall, Conn., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 6, 1977, Ser. No. 803,719

Int. Cl.[2] C08K 5/34

U.S. Cl. 260—45.8 N 11 Claims

1. A polymer composition stabilized against deterioration due to ultraviolet light and heat comprising a polyolefin and a minor proportion, sufficient to provide such stabilization, of a five-membered nitrogen ring compound having the structure AOCOR, ACOOR or ACONHR′ where A is a 2,2,5,5-tetraalkyl pyrrolidine or pyrroline wherein the alkyl groups are lower alkyl, R is alkyl, alkOCOA or alkCOOA where alk is an alkylene residue of a dicarboxylic or dihydroxy compound, and R′ is alkyl or alkNHCOA; or a salt thereof.

4,111,902

HEPTABROMODIBENZOFURAN, HIGHLY BROMINATED DIBENZOFURANS AND THE PREPARATION AND USE THEREOF AS FLAME RETARDANTS

Hermann Richtzenhain, Much-Schwellenbach, and Klaus Schrage, Königswinter-Uthweiler, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Fed. Rep. of Germany

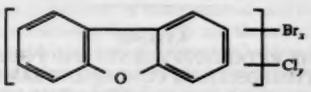
Filed Jul. 29, 1976, Ser. No. 709,692

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1975, 2534381

Int. Cl.[2] C08K 5/15; C07D 307/79

U.S. Cl. 260—45.8 A 14 Claims

1. Brominated dibenzofuran of the formula



wherein $x + y = 6.0$ to 7.0 and $y = 0$ to 0.3.

4,111,903

ORGANOTIN COMPOUNDS AND VINYL HALIDE RESIN COMPOSITIONS STABILIZED THEREWITH

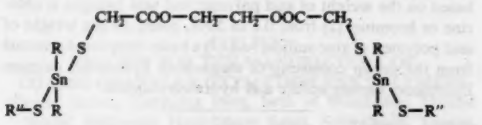
Samuel Hoch, Brooklyn, N.Y., and Emery Szabo, Freehold, N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed May 3, 1976, Ser. No. 682,430

Int. Cl.[2] C08J 3/20

U.S. Cl. 260—45.75 S 6 Claims

1. A heat and light stable resinous composition comprising a vinyl halide resin and 0.2 percent to 5 percent by weight, based on the weight of the vinyl halide resin, of an organotin compound having the structural formula



wherein each R represents an alkyl group having 1 to 8 carbon atoms and each R″ represents an alkyl group having 8 to 18 carbon atoms.

4,111,904

STABILIZATION OF POLYPYRROLIDONE

Edmond H. J. P. Bour, Limbricht, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

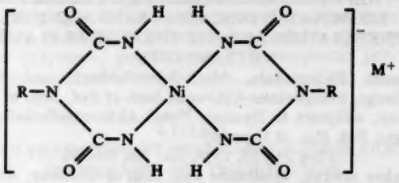
Filed Nov. 30, 1977, Ser. No. 855,979

Claims priority, application Netherlands, Dec. 2, 1976, 7613408

Int. Cl.[2] C08K 5/21

U.S. Cl. 260—45.75 N 6 Claims

1. A process for stabilizing polypyrrolidone polymer against thermal degradation which consists essentially blending with said polymer material an amount of between about 50 to about 5000 ppm by weight of a stabilizer compound of the formula



where R represents a hydrogen atom, or an alkyl radical of from 1 to 6 carbon atoms or an aryl radical of from 6 to 10 carbon atoms and wherein M^+ denotes a monovalent alkali metal cation.

4,111,905

FLAME RETARDING AGENTS AND POLYMER COMPOSITIONS CONTAINING SAME

William A. Larkin, Morristown, and Irving Touval, Edison, both of N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Jan. 28, 1977, Ser. No. 763,350

Int. Cl.² C08K 3/10

U.S. Cl. 260—45.75 B **20 Claims**

1. A flame retardant halogen-containing polymer composition comprising (1) a polymer selected from the group consisting of (a) polymers wherein at least a portion of the repeating units are derived from a halogen-containing monomer selected from the group consisting of ethylenically unsaturated compounds, (b) halogen-containing polyesters derived from the reaction of at least one dicarboxylic acid containing from 4 to 20 carbon atoms with at least one diol containing from 2 to 20 carbon atoms, (c) non-halogen-containing polymers wherein the repeating units are derived from at least one ethylenically unsaturated compound and (d) non-halogen-containing condensation polymers selected from the group consisting of polyesters, polyamides, polycarbonates, epoxide polymers and non-cellular polyurethanes, wherein any non-halogen-containing polymer is present in combination with an organic halogen-containing compound, the halogen content of any polymer composition is from 7 to 40% chlorine or 3 to 20% bromine, based on the weight of said polymer and said halogen is chlorine or bromine, (2) from 0.3 to 50%, based on the weight of said polymer, of zinc sulfide, and (3) a basic compound selected from the group consisting of magnesium hydroxide, calcium hydroxide, barium sulfate and hydrated alumina.

4,111,906

POLYIMIDES PREPARED FROM PERFLUOROISOPROPYLIDENE DIAMINE

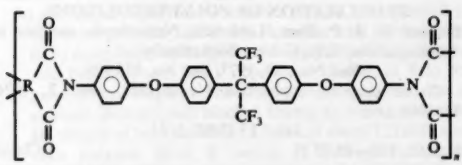
Robert J. Jones, Hermosa Beach; Michael K. O'Rell, Manhattan Beach, and Jim M. Hom, Sepulveda, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jul. 19, 1976, Ser. No. 706,880

Int. Cl.² C08G 73/10

U.S. Cl. 528—229 **3 Claims**

1. A polyimide consisting essentially of recurring units:



where *n* is an integer sufficient to provide a structure having an average molecular weight of at least 5000 wherein R is an organic radical of 5 to 22 atoms selected from the group consisting of tetravalent aliphatic radicals and tetravalent aromatic radicals.

4,111,907

PHOTOPOLYMERIZABLE KETONES

George Edward Green, Cherry Hinton; Bernard Peter Stark, Stapleford, and John Sidney Waterhouse, Cherry Hinton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

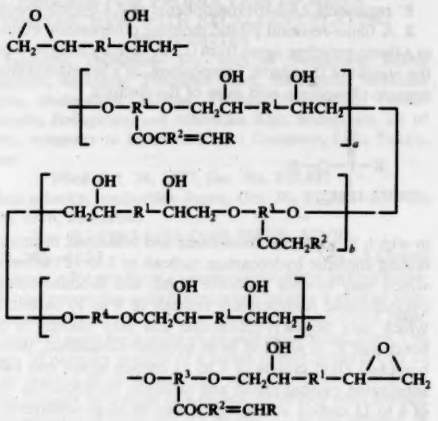
Filed Oct. 28, 1976, Ser. No. 736,636

Claims priority, application United Kingdom, Nov. 4, 1975, 45735/75

Int. Cl.² C08G 59/06, 59/14

U.S. Cl. 260—830 R **19 Claims**

1. An unsaturated ketone of the formula



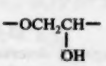
where

R represents a monovalent alkenyl, aralkenyl, cycloalkenyl, cycloalkylalkenyl, cycloalkenylalkenyl, heterocyclic or heterocyclic-alkenyl group of up to 20 carbon atoms having ethylenic unsaturation or heterocyclic aromaticity in conjugation with the indicated ethylenic double bond,

R^1 represents a carbon-carbon bond or a divalent, optionally substituted or interrupted, hydrocarbyl residue,

R^2 represents a hydrogen, chlorine, or bromine atom, a cyano group, or an aliphatic, aromatic, cycloaliphatic, araliphatic, cycloaliphatic-aliphatic, heterocyclic or heterocyclic-aliphatic group of 1 to 10 carbon atoms,

R^3 represents a trivalent aromatic or heterocyclic group bound directly through three carbon atoms thereof to the two indicated



and the indicated —$COCR^2$=CHR groups,

R^4 represents the residue, free of any substituent of formula —$COCH_2R^2$ or —$COCR^2$=CHR, of a dihydric phenol after removal of both phenolic hydroxyl groups, and

a, *b*, and *c* each represent zero or an integer such that the average molecular weight of the unsaturated ketone of formula I is from 500 to 50,000.

4,111,908

POLYKETONES AND METHODS THEREFOR

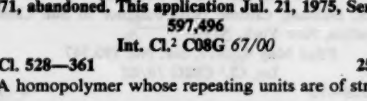
Klaus J. Dahl, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 366,326, Jun. 4, 1973, Pat. No. 3,914,218, which is a division of Ser. No. 218,446, Feb. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 115,824, Feb. 16, 1971, abandoned. This application Jul. 21, 1975, Ser. No. 597,496

Int. Cl.[2] C08G *67/00*

U.S. Cl. 528—361 25 Claims

1. A homopolymer whose repeating units are of structure



and whose mean inherent viscosity is within the range from about 0.5 to about 1.7 determined from a solution of 0.1 g polymer in 100 ml. concentrated sulfuric acid at 25° C.

4,111,909

CONTROLLED REACTIVITY EPOXY RESIN COMPOSITIONS

James Brandon Simons, Louisville, Ky., assignor to Celanese Polymer Specialties Company, Louisville, Ky.

Filed Apr. 11, 1977, Ser. No. 786,178

Int. Cl.[2] C08G *59/56*

U.S. Cl. 528—123 11 Claims

1. In a heat curable composition comprising a glycidyl polyether of a polyhydric phenol or polyhydric alcohol, dicyandiamide and a tertiary amine, the improvement which comprises the addition of a phosphorus compound in the amount of about 0.1 to about 2 weight percent based on the weight of the glycidyl polyether, wherein the phosphorus compound is represented by the formulas

R_3PO_4 and R_3PO_3

wherein each R, separately or combined, is hydrogen, or an alkyl, aryl, or haloalkyl radical, and wherein the alkyl group contains 1 to 20 carbon atoms, and the aryl group contains 6 to 18 carbon atoms.

4,111,910

POLYCARBONATES HAVING CARBAMATE TERMINAL GROUPS

Joseph M. Baggett, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 704,203, Jul. 12, 1976, abandoned. This application Nov. 2, 1977, Ser. No. 847,889

Int. Cl.[2] C08G *63/62*

U.S. Cl. 528196 7 Claims

1. A high molecular weight aromatic polycarbonate having carbamate terminal groups of the formula —O—C(O)—N(R)(R') wherein R and R' are independently selected from hydrogen, cycloalkyl, alkyl, and aralkyl groups of 1–18 carbons, and wherein the weight average molecular weight range is from about 10,000 to about 60,000.

4,111,911

METHOD OF HARDENING LIQUID RESOLS

Franz Weissenfels, Siegburg, and Hans Jünger, Troisdorf, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 386,675, Aug. 8, 1973, abandoned, which is a continuation of Ser. No. 201,244, Nov. 22, 1971, abandoned, which is a division of Ser. No. 830,865, Jun. 5, 1969, abandoned. This application Sep. 25, 1975, Ser. No. 616,539

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1968, 1769535

Int. Cl.[2] C08G *8/10*; C08K *3/04, 3/24, 3/30, 3/36, 3/38*

U.S. Cl. 260—38 8 Claims

1. In a process for producing a molded article from a liquid resol wherein into a mold there is introduced a liquid-form resol consisting essentially of the product formed by condensing 1 mol of a phenol with 1–3 mols of an aldehyde in an alkaline medium followed by water removal until the resin has a solid content between 60 and 80% and the mixture contains a hardener and in said mold the mixture is hardened to form a molded article, the improvement which comprises introducing said hardener into the liquid-form resol as a hardener mixture consisting essentially of said hardener and a diluent, said diluent being selected from the group consisting of silica, activated charcoal, bentonite, boric acid and boron trioxide, the hardener being a solid aromatic sulfonic acid selected from the group consisting of p-toluene sulfonic acid, a non-dyeing solid phenol sulfonic acid, o, m or p cresol sulfonic acid, chloro benzene 3,5-disulfonic acid, bromo benzene-4-sulfonic acid, aniline 2,5-disulfonic acid, naphthalene sulfonic acid and naphthylamine sulfonic acid and the diluent having a particle size between 10 and 50 millimicrons, the combined amount of sulfonic acid hardener and diluent which is added to the resol resin being such that the acid hardener is present in an amount of 2 to 20% by weight based upon the weight of said resol.

4,111,912

PROCESS FOR THE MANUFACTURE OF COARSE-GRANULAR OXYMETHYLENE POLYMERS

Günter Sextro; Karlheinz Burg, both of Wiesbaden; Helmut Schlaf, Kelkheim; Hans-Dieter Sabel, Schwalbach, Taunus, and Alwin Heller, Erzhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 4, 1977, Ser. No. 793,859

Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2620017

Int. Cl.[2] C08G *2/28*

U.S. Cl. 528—45 4 Claims

1. A process for making a granular oxymethylene polymer (POM) containing, in addition to oxymethylene units, from 0.1 to 20 per cent by weight of oxyalkylene units having from 2 to 8 adjacent carbon atoms in the main chain thereof, comprising the steps of cooling a solution or fine dispersion of the POM in a methanol/water mixture, the temperature of which is 5° to 65° C above the sintering temperature of the POM (T_s), in a first stage to a temperature of 0° C. to 10° C above T_s and then cooling the mixture in a second stage to a temperature of 1° C to 10° C. below T_s to form a suspension of POM particles having particle diameters both above and below 100 microns, recovering from said suspension and isolating from smaller particles, the solid POM-particles having a particle diameter exceeding 100 μm and drying them.

4,111,913

POLYURETHANE ELASTIC MOLDING MATERIAL

Gunter Schuhmacher, Weinheim an der Bergstr., and Horst Muhlfeld, Wahlen, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Bergstrasse, Fed. Rep. of Germany

Filed Jun. 26, 1975, Ser. No. 590,649

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1974, 2432090

Int. Cl.[2] C08G *18/28*

U.S. Cl. 528—273 11 Claims

1. A cured polyurethane composition comprising a polyol having a molecular weight in excess of about 500, a diisocyanate and a chain lengthener, the diisocyanate being present in about 0.4 to 1.4 times the weight of the polyol and in about 3.5 to 12.5 times the molar amount of the polyol, the chain lengthener having active hydrogen atoms and being present in about 3 to 12 times the molar amount of the polyol, the chain lengthener having a molecular weight of up to about 300, more than about 50 mole % of each of the polyol and diisocyanate units and less than about 50 mole % of the chain lengthener units comprising linear aliphatic C_6 units.

4,111,914

INITIATORS FOR ISOCYANATE REACTIONS

Jiri Kresta, Detroit, Mich., and Chen S. Shen, Strongsville, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 14, 1976, Ser. No. 695,897

Int. Cl.[2] C08G *18/02, 18/06, 18/16*

U.S. Cl. 528—48 21 Claims

1. A process for reacting an organic isocyanate with itself or another organic isocyanate which comprises contacting the reactants with an ar-sulfonium areneoxide present in an amount and under conditions sufficient to initiate the reaction of said reactants.

4,111,915

LITHIUM ALKENOXIDES IN PREPARATION OF FUNCTIONAL LIQUID CONJUGATED DIENE POLYMERS

Charles M. Selman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 625,744, Oct. 24, 1975, abandoned.

This application Feb. 1, 1977, Ser. No. 764,630

Int. Cl.[2] C08F *8/08, 8/42, 4/08*

U.S. Cl. 528—58 76 Claims

1. A process which comprises the steps of:

(a) copolymerizing (A) at least one polymerizable hydrocarbon conjugated diene, or at least one polymerizable hydrocarbon conjugated diene with at least one polymerizable hydrocarbon monovinyl-substituted aromatic compound monomer, with (B) at least one polymerizable lithium alkenoxide comonomer, under solution polymerization conditions including polymerization temperatures and pressures employing a hydrocarbon lithium initiator, wherein said lithium alkenoxide comonomer is employed in the range of about 0.1 to 6 parts by weight per 100 parts by weight of total monomers, and wherein said hydrocarbon lithium initiator is employed in a range of about 20 to 150 milliequivalents of lithium per 100 parts by weight of total monomers, thereby preparing a normally liquid copolymer,

(b) treating said normally liquid copolymer from said step (a) with an effective amount of an alkylene oxide,

(c) treating said liquid alkylene oxide treated copolymer with an effective amount of one or more of water, acid, or lower alcohol, thereby preparing a hydroxy functional liquid copolmer,

(d) partially curing said hydroxy functional liquid polymer with a polyisocyanate/polyol curing system, and

(e) molding said polyisocyanate/polyol cured polymer at effective temperatures and pressures, thereby producing a molded product.

4,111,916

PRINTING INK RESINS

Douglas S. DeBlasi, Clifton, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed May 4, 1977, Ser. No. 793,747

Int. Cl.[2] C08G *18/62*

U.S. Cl. 528—75 4 Claims

1. A printing ink resin prepared by (1) reacting a polyol having a functionality of at least 3 with acrylonitrile or an alkyl acrylate at a temperature of about 25° to 75° C., (2) acidifying the adduct product of step (1), and (3) reacting the remaining hydroxyl groups of the adduct with a polyisocyanate and at least one monofunctional reactive hydrogen-containing compound, glycol, or mixture thereof at a temperature of about 60° to 120° C. to form a polymer.

4,111,917

USE OF LATENT AMINES TO CURE EPOXY RESINS

Donald Wayne Larsen, Marriottsville, Md., assignor to W. R. Grace & Co., New York, N.Y.

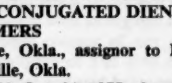
Filed May 11, 1976, Ser. No. 685,481

Int. Cl.[2] C08G *18/58*

U.S. Cl. 528—45 10 Claims

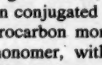
1. A process of curing a polyepoxide resin which comprises forming, at a temperature of from 25 to 90 degress C, an epoxy resin containing latent amine groups therein which is the reaction product of

(a) a member of the group consisting of tertiary alcohols and secondary alcohols with substituents in the alpha or beta position that activate dehydration; said member being a tertiary or secondary alcohol containing epoxy resin having the general formula:



wherein B is an organic polyvalent moiety, n is at least about 2 and m is 0.5 or greater; and

(b) an amount at least sufficient to produce substantially stoichiometric equivalents of latent amine to epoxy groups of an isocyanate of the formula:



wherein R is a mono- or polyvalent organic moiety and *n* is an integer of from 1 to 3; and

thereafter, heating the formed latent amine-containing epoxy resin to a temperature of from 100° to 200° C.

4,111,918

POLYPARABANIC ACID DERIVATIVES

Henning Giesecke, Cologne, Jürgen Hocker, Bergisch-Gladbach, and Rudolf Merten, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

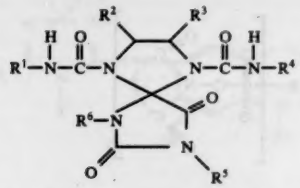
Filed Jun. 8, 1977, Ser. No. 804,608

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1976, 2625721

Int. Cl.[2] C08G *18/00*

U.S. Cl. 528—73 7 Claims

1. Polyparabanic acid derivatives which contain the following repeating structural unit from 2 to 100 times:



(I)

wherein

R^1, R^4, R^5 and R^6, which may be the same or different, each represents an optionally substituted aliphatic, aromatic or aliphatic-aromatic mono- or poly-functional radical; and

R^2 and R^3, which may be the same or different, each represents a hydrogen atom or an optionally substituted aliphatic, aromatic or aliphatic-aromatic radical, or may together form a ring.

4,111,919

THERMOSETTING COMPOSITION FROM A BIS-MALEIMIDE AND N-VINYL PYRROLIDONE

Max Gruffaz, La Mulatiere, and Jean-Louis Locatelli, Vienne, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Aug. 31, 1976, Ser. No. 719,282

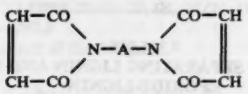
Claims priority, application France, Sep. 19, 1975 7529460

Int. Cl.² C08G *69/26*

U.S. Cl. 526—264 **2 Claims**

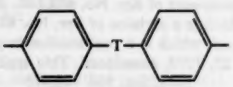
1. A thermosetting composition, characterized in that it consists essentially of, by weight,

from 60 to 90% of a bis-maleimide of the formula:



(I)

in which A represents a divalent radical chosen from the group consisting of phenylene radicals and radicals of the formula:



where T represents $-CH_2-$, $-C(CH_3)_2-$, $-O-$ or $-SO_2-$; and

from 10 to 40% of N-vinylpyrrolid-2-one.

4,111,920

POLYETHER URETHANES AS ANTISTATIC ADDITIVES IN POLYAMIDE COMPOSITIONS

Hans Egon Künzel, Dormagen, and Francis Bentz, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

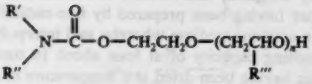
Filed Apr. 27, 1976, Ser. No. 680,668

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1975, 2519259; Apr. 30, 1975, 2519260

Int. Cl.² C08L *77/00, 77/02, 77/04*

U.S. Cl. 526—6 **5 Claims**

1. Antistatic composition consisting essentially of an aliphatic polycarbonamide and, as an antistatic additive, from 0.5 to 15% by weight of the whole composition of a polyalkylene glycol ether with secondary urethane groups corresponding to the general formula:



(I)

in which

R′ and R″ independently of one another represent a member selected from the group consisting of a straight chain, cyclic or branched, saturated or unsaturated aliphatic hydrocarbon radical, an aralkyl radical and an alkyl-substituted aromatic radical, at least one of the two radicals R′ and R″ is an alkyl radical with from 10 to 30 carbon atoms,

R‴ represents a member selected from the group consisting of hydrogen atom, an alkyl group with from 1 to 5 carbon atoms, a cycloalkyl, an arylalkyl and an aralkyl group, and

n is a number of 3 to 45.

4,111,921

TRANSPARENT POLYAMIDES

Gerhard Bier, Troisdorf; Franz Blaschke, Witten, Ruhr; Helmut aus der Fünten, Niederkassel-Mondorf, and Gerhard Schade, Witten-Bommern, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Sep. 21, 1976, Ser. No. 725,304

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1975, 2542938

Int. Cl.² C08G *69/26*

U.S. Cl. 528—338 **9 Claims**

1. A film forming polyamide composition consisting essentially of the polymeric condensation product of (1) terephthalic acid, (2) 2-methylpentamethylenediamine and at least one of (3) 2-ethyltetramethylenediamine or (4) isophthalic acid or (5) a mixture of 2-ethyltetramethylenediamine and isophthalic acid, the concentration of said (3) 2-ethyltetramethylenediamine or (4) isophthalic acid or (5) mixture totalling 15 to 30 mole percent, with respect to the sum of all diamine or dicarboxylic acid.

4,111,922

HYDROPHILIC RANDOM INTERPOLYMER FROM QUATERNARY AMMONIUM MONOMERS AND METHOD FOR MAKING SAME

Charles H. Beede, East Brunswick, N.J.; Harold L. Waldman, Sunbury, Pa., and Theodore Blumig, East Brunswick, N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 509,207, Sep. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 270,118, Jul. 10, 1972, abandoned. This application Apr. 7, 1976, Ser. No. 674,471

Int. Cl.² C08F *220/34, 220/35*

U.S. Cl. 526—292 **16 Claims**

1. In a random interpolymer derived from the polymerization of a mixture of monomers comprising: (A) (1) from about 10 to about 90% by weight of said mixture of a first monomer which is an ester of an α,β-olefinically unsaturated carboxylic acid and a monohydric or polyhydric alcohol having a terminal quaternary ammonium group and (2), correspondingly, from about 90 to about 10% by weight of said mixture of at least one α,β-olefinically unsaturated comonomer capable of being dispersed in aqueous media, in the presence of (B) at least 0.02% by weight, based on the weight of said mixture, of a cross-linking agent comprising a difunctional monomer which is capable of being dispersed or dissolved in aqueous media and is an ester or amide of an α,β-olefinically unsaturated carboxylic acid; the improvement wherein said comonomer (2) comprises (a) at least 10% by weight of said mixture of monomers of an acid comonomer, or (b) at least 20% by weight of said mixture of monomers of an amide comonomer, or (c) at least 10% by weight of said mixture of monomers of a combination of acid and amide comonomers, said combination containing at

least 5% by weight of said mixture of an acid monomer, said interpolymer having been prepared by free-radical polymerization in an aqueous medium whereby said interpolymer has a water adsorbing capacity of at least about 10 times its own weight after having been dried at a temperature of about 100° C. for about 3 hours.

4,111,923

OCTAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Eugene Leroy Wittle; Mildred Catherine Rebstock; Ernest D. Nicolaides, and Alfred Campbell, all of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Continuation-in-part of Ser. No. 626,909, Oct. 29, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,468

Int. Cl.[2] C07C *103/52;* A61K *37/02*

U.S. Cl. 260—112.5 R 22 Claims

1. A compound having the name N^{α}-benzyloxycarbonyl-L-glutaminyl-L-tryptophyl-L-seryl-L-tyrosyl-D-alanyl-L-leucyl-L-arginyl-L-proline N-ethylamide and salts thereof.

4,111,924

METHOD FOR REMOVAL OF THIOL-PROTECTING GROUPS

Masahiko Fujino, Takarazuka; Osamu Nishimura, Toyonaka, and Chieko Kitada, Sakai, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 13, 1977, Ser. No. 805,900

Claims priority, application Japan, Jun. 28, 1976, 51-76676

Int. Cl.[2] C07C *103/52;* C07G *7/00*

U.S. Cl. 260—112.5 R 3 Claims

1. A method for removing the S-protecting group from an amino acid or peptide having a thiol group protected with a p-mertoxybenzyl, 1-adamantyl or t-butyl group, comprising reacting the protected amino acid or peptide with the mercuric salt of acetic acid in a member selected from the group consisting of trifluoroacetic acid and the mercuric salt of trichloro- or trifluoroacetic acid in acetic acid to thereby substitute the protective group with mercury and remove the mercury from the amino acid or peptide.

4,111,925

HYDROLYSIS OF ESTERS OF α-L-ASPARTYL-L-PHENYLALANINE

Gerald L. Bachman, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 14, 1977, Ser. No. 842,421

Int. Cl.[2] C07C *103/52*

U.S. Cl. 260—112.5 R 13 Claims

1. A process which comprises contacting, at a reaction pH greater than 7, an alkyl ester of α-L-aspartyl-L-phenylalanine with an aqueous solution containing barium ions to form α-L-aspartyl-L-phenylalanine.

4,111,926

HARDENING AGENT FOR GELATIN AND METHOD FOR HARDENING GELATIN

Hidefumi Sera; Hisashi Shiraishi, and Tsumoru Ishii, Minami-ashigara, Japan, assignors to Fuji Photo Co., Ltd., Kanagawa, Japan

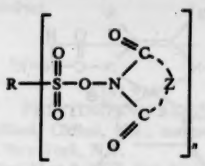
Filed Feb. 1, 1977, Ser. No. 764,506

Claims priority, application Japan, Feb. 2, 1976, 51-10542

Int. Cl.[2] C09H *7/00*

U.S. Cl. 260—117 13 Claims

1. A method of hardening gelatin which comprises treating gelatin with a compound represented by the formula (I):



(I)

wherein R represents an *n*-valent organic group; Z represents an atomic group necessary to complete a 5- or 6-membered ring; and *n* represents 1, 2 or 3.

4,111,927

EXTRACTION OF PROTEIN FROM *PHASEOLUS AUREUS, PHASEOLUS VULGARIS* AND *PHASEOLUS LUNATUS* BEANS USING SODIUM CHLORIDE

Lowell D. Satterlee, Lincoln, Nebr., assignor to Board of Regents of the University of Nebraska, Lincoln, Nebr.

Continuation-in-part of Ser. No. 593,460, Jul. 7, 1975, abandoned. This application May 12, 1977, Ser. No. 796,182

Int. Cl.[2] A23J *1/14*

U.S. Cl. 260—123.5 9 Claims

1. A method for producing a non-toxic, edible plant protein which comprises the steps of finely dividing one or more varieties of natural dried beans selected from the group consisting of *Phaseolus vulgaris, Phaseolus aureus* and *Phaseolus lunatus,* mixing the finely divided bean particles with an aqueous sodium chloride solution of concentration of not over about 0.6% w/v sodium chloride which extracts protein from the bean particles and separating the extracted protein from said mixture including the step of precipitating the protein with acid.

4,111,928

METHOD OF SEPARATING LIGNIN AND MAKING EPOXIDE-LIGNIN

Dale B. Holsopple, 23381 Aurora Rd., Bedford Heights; Wasyl W. Kurple, 110 W. Grace, Bedford, both of Ohio 44146; William M. Kurple, 8429 N. 27th Ave., Phoenix, Ariz. 85021, and Kenneth R. Kurple, 60691 New Haven Rd., New Haven, Mich. 48048

Continuation-in-part of Ser. No. 608,640, Aug. 28, 1975, abandoned, which is a division of Ser. No. 453,672, Mar. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 354,356, Apr. 25, 1973, abandoned. This application Nov. 18, 1976, Ser. No. 742,773

Int. Cl.[2] C07G *1/00*

U.S. Cl. 260—124 R 19 Claims

1. The method of separating lignin from aqueous waste black liquor, comprising the steps of contacting the waste black liquor with an organic chemical solvent in which the lignin is at least partially soluble and adding acid to the mixture to lower the pH to thereby separate a layer which layer contains lignin in said organic chemical solvent separate from an aqueous layer.

4,111,929

TETRAHYDROQUINOLINE AZO TRIAZOLE DYESTUFFS

David Melville Fawkes, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

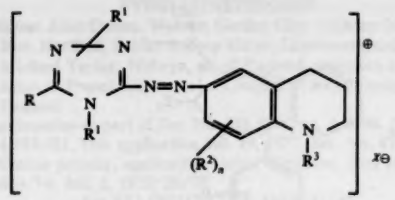
Filed Jul. 6, 1976, Ser. No. 702,733

Claims priority, application United Kingdom, Jul. 11, 1975, 29226/75

Int. Cl.[2] C09B *29/36;* D06P *1/08, 1/10, 3/76*

U.S. Cl. 260—146 R 3 Claims

1. An azo dyestuff of the formula:



wherein R is hydrogen, methyl or phenyl, R^1 is methyl, ethyl or benzyl, R^2 is methyl, ethyl, methoxy or chloro, n is 0 or 1 and when n is 1, R^2 is in the 7- position of the tetrahydroquinoline ring and R^3 is straight chain butyl, pentyl or hexyl and X is an anion.

4,111,930

MONOAZO DYES HAVING AN ARYLOXYALKYL GROUP ON THE NITROGEN ATOM IN THE PARA POSITION OF A 1,4-PHENYLENE COUPLING COMPONENT RADICAL

Jacques Meybeck, Boulogne, France, assignor to Sandoz Ltd., Basel, Switzerland

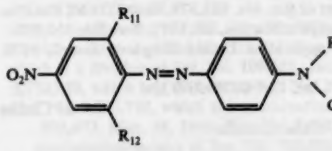
Continuation of Ser. No. 286,437, Sep. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 49,580, Jun. 24, 1970, abandoned. This application Mar. 22, 1976, Ser. No. 669,165

Claims priority, application Switzerland, Jul. 17, 1969, 10935/69

Int. Cl.[2] C09B *29/00, 29/08, 29/26;* D06P *1/18*

U.S. Cl. 260—207.5 **10 Claims**

1. A compound of the formula



wherein

R_4 is hydrogen, methyl, ethyl or cyclohexyl,

R_{11} is hydrogen, chloro or bromo, and

R_{12} is hydrogen or chloro.

4,111,931

1,2,3,5-TETRAHYDRO-4H-1,5-BENZODIAZEPINE-4-ONES

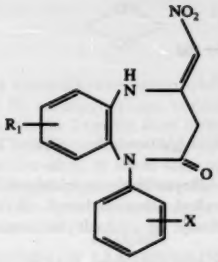
Armin Walser, West Caldwell, and Rodney Ian Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 775,347, Mar. 7, 1977, Pat. No. 4,080,323. This application Feb. 1, 1978, Ser. No. 874,074

Int. Cl.[2] C07D *243/12*

U.S. Cl. 260—239.3 B **5 Claims**

1. A compound of the formula



wherein X is hydrogen or halogen and R_1 is hydrogen, halogen or trifluoromethyl.

4,111,932

AMINO ACID DERIVATIVES OF 6-(2-AMINO-2-ARYLACETAMIDO)PENICILLANIC ACIDS

Yoshiharu Morita; Kenzo Omata, both of Yokohama; Junichi Ohya, Zama; Kazuo Wagatsuma, Yokohama, and Tadashi Shirasaka, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Aug. 12, 1976, Ser. No. 713,808

Claims priority, application Japan, Sep. 8, 1975, 50-108708; Sep. 8, 1975, 50-108709; Feb. 6, 1976, 51-12119; Feb. 6, 1976, 51-12121; Feb. 14, 1976, 51-15335; Feb. 16, 1976, 51-15563

Int. Cl.[2] C07D *499/68*

U.S. Cl. 260—239.1 **1 Claim**

1. 6-[D-2-prolyamino-2-(4-hydroxyphenyl)acetamido]-penicillanic acid and non-toxic pharmaceutically acceptable salts thereof.

4,111,933

PROTECTION OF FUNCTIONAL GROUPS DURING REACTION AND THEIR SUBSEQUENT RESTORATION

Heiner Eckert; Ivar Ugi, both of Munich, and Hans-Joachim Kabbe, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 28, 1977, Ser. No. 792,080

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619247

Int. Cl.[2] C07D *499/04*

U.S. Cl. 260—239.1 **20 Claims**

1. In the process for preparing an organic compound of the formula

$$A' - X$$

in which

X is an amino group, a hydroxyl group or a carboxyl group, and

A′ is the remainder of the molecule, from an organic compound of the formula

$$A - X$$

in which

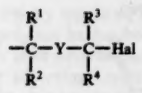
A is the remainder of the molecule which can undergo reaction to form A′, by converting A — X into a compound of the formula

$$A - Z - COOR$$

in which

Z is —NH—, —O— or a direct C—C bond, and

R is a radical of the formula



in which

Y is a direct C-C single bond, the —CH=CH— group or an arylene group,

R^1 to R^4 each independently is hydrogen, halogen or an alkyl, aryl, aralkyl, alkoxycarbonyl, alkylaminocarbonyl, arylaminocarbonyl or cycloalkylaminocarbonyl radical, or

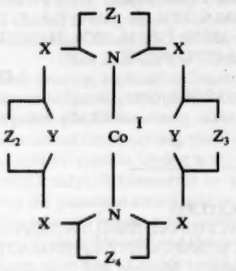
$R^1 + R^2$ and $R^3 + R^4$ each independently completes a 5- or 6-membered carbocyclic ring, or R^1 and R^3 conjointly with the grouping —C—Y—C— forms a carbocyclic ring with 5 or 6 carbon atoms, and

Hal is halogen,

thereby to protect X, then converting A — Z — COOR into a compound of the formula

A′ — Z — COOR

and then treating the compound A′ —Z — COOR to restore the group X, the improvement which comprises effecting the treatment of the compound A′ — Z — COOR with an alkali metal compound of a complex of monovalent cobalt in which the complex of monovalent cobalt has the formula



in which Y is nitrogen, oxygen or sulfur, Z_1, Z_2, Z_3 and Z_4 each independently is the grouping CH—CH, N—N, or CH—N, and together with Y or N forms a five-membered ring which is optionally substituted and optionally fused to an optionally substituted and optionally fused to an optionally substituted benzene nucleus, and X is a nitrogen atom or the grouping $—CH_8$, wherein R_8 denotes hydrogen, alkyl or aryl.

4,111,934

1,5-BENZODIAZEPIN-4-ONES

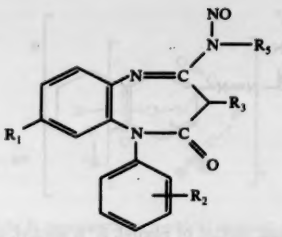
Rodney Ian Fryer, North Caldwell; Leo Henryk Sternbach, Upper Montclair, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 371,442, Jun. 19, 1973, abandoned. This application Dec. 15, 1977, Ser. No. 861,084

Int. Cl.² C07D *243/12, 487/04*

U.S. Cl. 260—239.3 B **1 Claim**

1. A compound of the formula



wherein R_1 is selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, trifluoromethyl, nitro and amino; R_2 signifies hydrogen, halogen, or lower alkoxy; R_3 signifies hydrogen or lower alkyl and R_5 signifies lower alkyl.

4,111,935

3-CHLORO-6-PHENYLPYRIDAZINE COMPOUNDS

William John Coates, Welwyn Garden City; Anthony Maitland Roe, Hatfield; Robert Antony Slater, Letchworth, and Edwin Michael Taylor, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

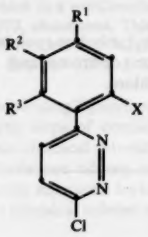
Continuation-in-part of Ser. No. 583,379, Jun. 3, 1975, Pat. No. 4,053,601. This application Jul. 19, 1977, Ser. No. 816,993

Claims priority, application United Kingdom, Jan. 2, 1975, 20/75

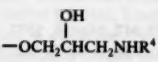
Int. Cl.² C07D *237/12*

U.S. Cl. 544—224 **11 Claims**

1. A compound of the formula:



wherein two of the groups R^1, R^2 and R^3 are hydrogen and the third group is hydrogen, fluoro, chloro, bromo, hydroxy, lower alkoxy, lower alkenyloxy or lower alkoxycarbonyl; and X is



where R^4 is isopropyl, tertiary butyl or 2-phenylethyl, or when R^1, R^2 and R^3 are other than hydroxy, X may also be hydroxy.

4,111,936

PYRIDAZINETHIONES

William John Coates, Welwyn Garden City; Anthony Maitland Roe, Hatfield; Robert Antony Slater, Letchworth, and Edwin Michael Taylor, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

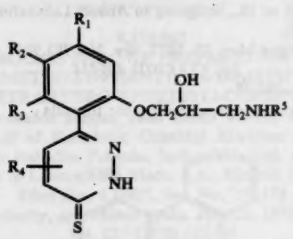
Continuation-in-part of Ser. No. 583,379, Jun. 3, 1975, Pat. No. 4,053,601. This application Jul. 19, 1977, Ser. No. 816,986

Claims priority, application United Kingdom, Jun. 18, 1974, 26864/74; Jan. 2, 1975, 20/75

Int. Cl.[2] C07D *237/18;* A01N *31/50*

U.S. Cl. 544—239 13 Claims

1. A compound of the formula:



wherein two of the groups R_1, R_2 and R_3 are hydrogen and the third group is hydrogen, lower alkyl, fluoro, chloro, bromo, trifluoromethyl, hydroxy, lower alkoxy, lower alkenyloxy, lower alkoxycarbonyl, cyano, $—CONH_2$, $—CH_2CONH_2$, nitro, amino, lower alkanoylamino, lower alkylamino or di(lower alkyl)amino; R_4 is hydrogen or methyl; and R^5 is isopropyl, tertiary butyl or 2-phenylethyl.

4,111,937

IODINATED ANILIC ACIDS

James H. Ackerman, Albany, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

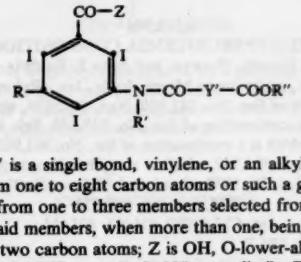
Division of Ser. No. 478,052, Jun. 10, 1974, Pat. No. 4,031,088, which is a division of Ser. No. 323,710, Jan. 15, 1973, abandoned, which is a division of Ser. No. 109,631, Jan. 25, 1971, Pat. No. 3,770,820, which is a division of Ser. No. 25,262, Apr. 2, 1970, Pat. No. 3,666,760, which is a continuation-in-part of Ser. No. 808,653, Mar. 19, 1969, Pat. No. 3,609,147, which is a continuation-in-part of Ser. No. 715,558, Mar. 25, 1968, abandoned, which is a continuation-in-part of Ser. No. 550,614, May 17, 1966, abandoned, said Ser. No. 808,653, is a continuation-in-part of Ser. No. 715,583, Mar. 25, 1968, abandoned. This application Oct. 18, 1976, Ser. No. 733,298

Claims priority, application United Kingdom, May 11, 1967, 21897/67

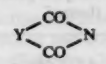
Int. Cl.[2] C07D *211/88, 207/40, 207/44, 279/12*

U.S. Cl. 260—281 GN 3 Claims

1. A compound of the formula



wherein Y' is a single bond, vinylene, or an alkylene bridge having from one to eight carbon atoms or such a group interrupted by from one to three members selected from O, S, SO and SO_2, said members, when more than one, being separated by at least two carbon atoms; Z is OH, O-lower-alkyl, lower-alkyl, phenyl, NH(lower-alkyl), N(lower-alkyl)$_2$; R is



wherein Y is a lower-alkylene group wherein 2 or 3 carbon atoms separate the carbonyl groups, vinylene, or a 1,3-propylene group wherein the 2-carbon atom is replaced by O, S, SO or SO_2; R' is hydrogen, lower-alkyl, hydroxy-lower-alkyl, lower-alkoxy-lower-alkyl, or lower-alkoxy-lower-alkoxy-lower-alkyl; and R'' is hydrogen or lower-alkyl.

4,111,938

PREPARATION OF 2,3,5-TRICHLOROPYRIDINE

Carl T. Redemann, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 14, 1977, Ser. No. 833,126

Int. Cl.[2] C07D *213/02*

U.S. Cl. 260—290 HL 3 Claims

1. A method for preparing 2,3,5-trichloropyridine which comprises reacting at a pH of 11 or above and at a temperature of from about 20° to about 100° C., a pyridine reactant selected from the group consisting of 2,3,5,6-tetrachloropyridine and pentachloropyridine with from 1 to 3 gram atoms of zinc per gram atom of chlorine to be removed, in the presence of an alkaline reagent and a water-immiscible reaction medium.

4,111,939

FURYL PYRAZOLE THIOAMIDES

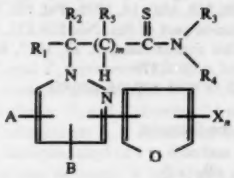
Malcolm W. Moon, and Gabriel Kornis, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 686,548, May 14, 1976, Pat. No. 4,072,498, which is a continuation-in-part of Ser. No. 524,231, Nov. 15, 1974, abandoned. This application Oct. 27, 1977, Ser. No. 846,180

Int. Cl.[2] C07D *405/04, 405/14*

U.S. Cl. 260—293.6 1 Claim

1. A compound of the formula:



IV

where R_1 is hydrogen, alkyl of 1 to 7 carbon atoms, inclusive, haloalkyl of 1 to 7 carbon atoms, inclusive, phenyl, benzyl or cycloalkyl of 3 to 6 carbon atoms, inclusive, with the proviso that when R_1 is benzyl or cycloalkyl $m = 0$; R_2 and R_5 are the same or different and are hydrogen, halogen, alkyl of 1 to 6 carbon atoms, inclusive, haloalkyl of 1 to 6 carbon atoms, inclusive, or phenyl; R_1 and R_2 together with the attached carbon atom can be cycloalkyl of 3 to 6 carbon atoms, inclusive, when $m = 0$; m is 0 or 1 provided that when $m = 0$, R_1 is not hydrogen and when $m = 1$ at least one of R_2 or R_5 is hydrogen; R_3 is hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, phenyl or benzyl; R_4 is hydrogen or alkyl of from 1 to 6 carbon atoms, inclusive, and R_3 and R_4 can be joined together to form a heterocyclic ring selected from the group consisting of pyrrolidine, or piperidine; A and B are the same or different and are hydrogen, alkyl of from 1 to 6 carbon atoms, inclusive, phenyl, halogen, cyano, haloalkyl of 1 to 6 carbon atoms, inclusive, alkoxy or alkylthio in which the alkyl group is from 1 to 3 carbon atoms, inclusive, or trifluoromethyl and when adjacent can be joined to form a ring of from 5 to 7 carbon atoms, inclusive; where X is halogen, nitro, cyano, acetyl, dimethylcarbamoyl, alkyl, haloalkyl, alkoxy or carboalkoxy in which the alkyl groups is from 1 to 3 carbon

atoms, inclusive, phenyl, benzyl, 2-phenylethyl and *n* is 0, 1, or 2 or an acid addition salt thereof.

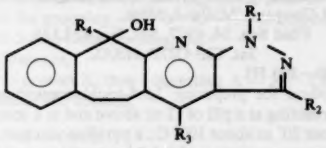
4,111,940

1,5,6,11-TETRAHYDRO[5,6]CYCLOHEPTA-[1,2,-b]PYRAZOLO[4,3-e]PYRIDINE DERIVATIVES

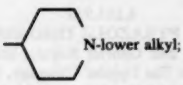
Hans Hoehn, Tegernheim, Fed. Rep. of Germany; Jack Bernstein, New Brunswick, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 7, 1977, Ser. No. 785,398
Int. Cl.[2] C07D *471/04*
U.S. Cl. 260—293.6 **7 Claims**

1. A compound of the formula:



wherein R_1 is lower alkyl, phenyl, or phenyl-lower alkyl; R_2 is hydrogen, lower alkyl, or phenyl; R_3 is hydrogen, halogen, or lower alkoxy; R_4 is



and a pharmaceutically acceptable salt thereof.

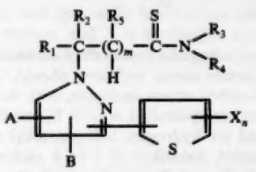
4,111,941

THIENYL PYRAZOLE THIOAMIDES

Malcolm W. Moon, and Gabriel Kornis, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 686,548, May 14, 1976, Pat. No. 4,072,498, which is a continuation-in-part of Ser. No. 524,231, Nov. 15, 1974, abandoned. This application Oct. 27, 1977, Ser. No. 846,179
Int. Cl.[2] C07D *409/04, 409/14*
U.S. Cl. 260—293.6 **1 Claim**

1. A compound of the formula:



III

where R_1 is hydrogen, alkyl of 1 to 7 carbon atoms, inclusive, haloalkyl of 1 to 7 carbon atoms, inclusive, phenyl, benzyl or cycloalkyl of 3 to 6 carbon atoms, inclusive, with the proviso that when R_1 is benzyl or cycloalkyl $m = 0$; R_2 and R_5 are the same or different and are hydrogen, halogen, alkyl of 1 to 6 carbon atoms, inclusive, haloalkyl of 1 to 6 carbon atoms, inclusive, or phenyl; R_1 and R_2 together with the attached carbon atom can be cycloalkyl of 3 to 6 carbon atoms, inclusive, when $m = 0$; m is 0 or 1 provided that when $m = 0$, R_1 is not hydrogen and when $m = 1$ at least one of R_2 or R_5 is hydrogen; R_3 is hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, phenyl or benzyl; R_4 is hydrogen or alkyl of from 1 to 6 carbon atoms, inclusive, and R_3 and R_4 can be joined together to form a heterocyclic ring selected from the group consisting of pyrrolidine, or piperidine; A and B are the same or different and are hydrogen, alkyl of from 1 to 6 carbon atoms, inclusive, phenyl, halogen, cyano, haloalkyl of 1 to 6 carbon atoms, inclusive, alkoxy or alkylthio in which the alkyl group is from 1 to 3 carbon atoms, inclusive, or trifluoromethyl and when adjacent can be joined to form a ring of from 5 to 7 carbon atoms, inclusive; where X is halogen, nitro, cyano, acetyl, dimethylcarbamoyl, alkyl, haloalkyl, alkoxy or carboalkoxy in which the alkyl group is from 1 to 3 carbon atoms, inclusive, phenyl, benzyl, 2-phenylethyl and *n* is 0, 1, or 2 or an acid addition salt thereof.

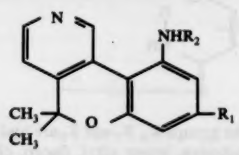
4,111,942

10-AMINO-5H-[1]BENZOPYRANO[4,3-c]PYRIDINES

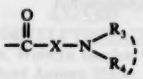
Cheuk Man Lee, Libertyville, and Harold Elmer Zaugg, Lake Forest, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 28, 1977, Ser. No. 781,903
Int. Cl.[2] C07D *405/14*
U.S. Cl. 260—293.58 **9 Claims**

1. A compound represented by the formula



where R_1 is C_3–C_{20} alkyl or halophenyllowеralkyl; R_2 is hydrogen, loweralkanoyl, loweralkylsulfonyl, loweralkoxycarbonyl, carbamoyl or



wherein X is an alkylene group having from 2 to 4 carbon atoms; and R_3 and R_4 are the same or different members of the group consisting of hydrogen or loweralkyl; or R_3 and R_4 taken together form a 5-, 6-, or 7-member heterocyclic ring; and the pharmaceutically acceptable acid addition salts thereof.

4,111,943

3-(THIENYLOXY)PYRIDINES AND METHODS FOR THEIR PRODUCTION

Donald Eugene Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 20, 1977, Ser. No. 789,031
Int. Cl.[2] C07D *417/02*
U.S. Cl. 260—294.8 D **4 Claims**

1. A compound selected from the group consisting of 3-(2-thienyloxy)pyridine, 3-(3-thienyloxy)pyridine and pharmaceutically acceptable acid-addition salts thereof.

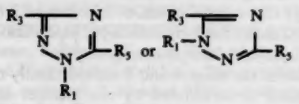
4,111,944

ANTI-HYPERURICEMIA COMPOSITION

Frederick C. Novello, Berwyn, and John J. Baldwin, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 742,945, Nov. 18, 1976, abandoned, which is a continuation of Ser. No. 547,848, Feb. 6, 1975, abandoned, which is a continuation of Ser. No. 361,915, May 21, 1973, Pat. No. 3,892,762, which is a continuation-in-part of Ser. No. 75,784, Sep. 25, 1970, abandoned. This application Jun. 21, 1977, Ser. No. 808,575
Int. Cl.[2] C07D *401/02, 401/14*
U.S. Cl. 260—296 R **3 Claims**

1. A compound of the formula:



wherein R_1 is lower alkyl;

R_3 is phenyl, lower alkylphenyl, tri-lower alkylphenyl, 4-pyridyl, mono-lower alkyl-4-pyridyl or di-lower alkyl-4-pyridyl; and R_5 is 4-pyridyl, mono-lower alkyl-4-pyridyl or di-lower alkyl-4-pyridyl, including the mono-N-oxides of those products wherein R_3 and R_5 are both a pyridyl.

4,111,945

PROCESS FOR THE PREPARATION OF 3,4,5-TRIMETHOXY-PHENYL-(1,4-DIMETHYL-1,2,3,6-TETRAHYDRO-2-PYRIDYL)-CARBINOL

Ricardo Granados Jarque; Juan Bosch Cartés; Jorge Canals Cabiró, all of Barcelona; Cristóbal Martínez Roldán, and Fernando Rabadán Peinado, both of Madrid, all of Spain, assignors to Laboratories Made, S.A., Madrid, Spain

Filed Jan. 6, 1977, Ser. No. 757,175

Claims priority, application Spain, Jan. 22, 1976, 444.539

Int. Cl.[2] C07D *211/70*

U.S. Cl. 260—297 R **1 Claim**

1. A compound selected from the group consisting of 3,4,5-trimethoxyphenyl-(1,4-dimethyl-1,2,3,6-tetrahydro-2-pyridyl)-carbinol and its pharmaceutically acceptable acid addition salts.

4,111,946

PREPARATION OF 3-(PYRIDINYL)-2-CYCLOHEXEN-1-ONES

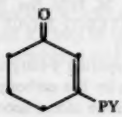
Karl O. Gelotte, Nassau; Andrew W. Zalay, Albany, and Malcolm R. Bell, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 737,392, Nov. 1, 1976, Pat. No. 4,075,217, which is a division of Ser. No. 668,451, Mar. 19, 1976, Pat. No. 4,026,900. This application Jul. 29, 1977, Ser. No. 820,402

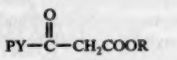
Int. Cl.[2] C07D *213/46*

U.S. Cl. 260—297 R **3 Claims**

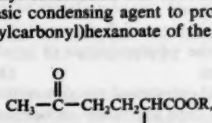
1. The process for preparaing a 3-(pyridinyl)-2-cyclohexen-1-one having the formula



where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, which comprises reacting methyl vinyl ketone with lower-alkyl 3-(pyridinyl)-3-oxo-propanoate of the formula



where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents and R is lower-alkyl, in the presence of a basic condensing agent to produce lower-alkyl 5-oxo-2-(pyridinylcarbonyl)hexanoate of the formula



heating said hexanoate under aqueous acidic conditions thereby hydrolyzing and decarboxylating it to produce 1-PY-hexan-1,5-dione and reacting said hexan-1,5-dione with a basic condensing agent to produce said 3-PY-2-cylohexen-1-one or first reacting said lower-alkyl 5-oxo-2-(pyridinylcarbonyl)hexanoate with a basic condensing agent to produce lower-alkyl 3-(pyridinyl)-2-cyclohexen-1-one-4-carboxylate and then heating under aqueous acidic conditions to hydrolyze and decarboxylate said 4-carboxylate to produce said 3-(pyridinyl)-2-cyclohexen-1-one.

4,111,947

NOVEL METAL COMPLEXES OF AZOMETHINES AND PROCESS FOR THEIR MANUFACTURE

François L'Eplattenier, Therwil; André Pugin, and Jost von der Crone, both of Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

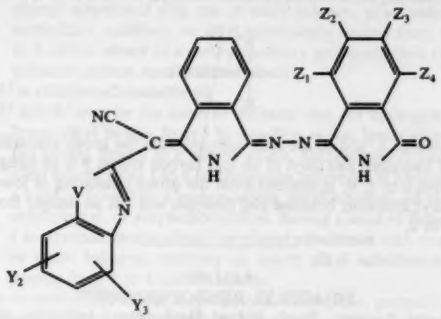
Division of Ser. No. 545,457, Jan. 30, 1975, Pat. No. 4,022,770. This application Mar. 1, 1977, Ser. No. 773,251

Claims priority, application Switzerland, Feb. 6, 1974, 1625/74

Int. Cl.[2] C07D *403/14*; D06P *1/642*; C07D *401/06, 405/06*

U.S. Cl. 260—299 **2 Claims**

1. A 1:1-metal-complex of a compound of the formula



wherein Z_1 and Z_3 represent hydrogen, halogen, alkoxy of 1 to 4 carbon atoms, alkylmercapto of 1 to 4 carbon atoms, phenoxy, phenalkoxy; Z_2 and Z_4 represent hydrogen, halogen, and one of the substituents Z_1 to Z_4 can also be nitro; Y_2 and Y_3 are hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or nitro; V is oxygen, sulfur or imino; and wherein said metal is Ni, Cu, Co, or Zn.

4,111,948

PROCESS FOR THE PREPARATION OF 4-METHYLTHIAZOLE

Henry S. Kao, Mountainside; William A. Sklarz, Edison, and Leonard M. Weinstock, Belle Mead, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 590,893, Jun. 27, 1975, abandoned, which is a continuation of Ser. No. 383,925, Jul. 30, 1973, abandoned. This application Nov. 26, 1976, Ser. No. 745,517

Int. Cl.[2] C07D *277/02*

U.S. Cl. 260—302 R **5 Claims**

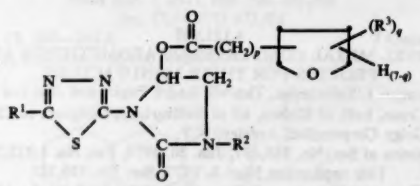
1. A process for preparing 4-methylthiazole from 2-mercapto-4-methylthiazole comprising reacting 2-mercapto-4-methylthiazole in an aqueous alkali metal hydroxide solution with an oxidant consisting of oxygen or a mixture of oxygen and an inert gas at a pressure of from about 0.1 to about 100 atmospheres based on a partial pressure of oxygen of from about 0.1 to about 150 atmospheres, wherein there is dispersed in the aqueous solution cobalt phthalocyanine disulfonate to form a thiazole sulfinate salt and hydrolizing the thiazole sulfinate salt with acid or heating at a temperature of 40°–110° C.

4,111,949
THIADIAZOLYLIMIDAZOLIDINONE ESTERS OF TETRAHYDROFURYL SUBSTITUTED ACIDS

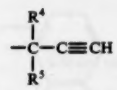
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Company, Chicago, Ill.

Filed Mar. 25, 1976, Ser. No. 670,493
Int. Cl.[2] C07D 417/14
U.S. Cl. 260—306.8 D 8 Claims

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and



wherein R^4 and R^5 are each selected from the group consisting of hydrogen and alkyl of up to 3 carbon atoms; p is an integer from 0 to 3; R^3 is selected from the group consisting of lower alkyl, chlorine, bromine and fluorine; and q is an integer from 0 to 2.

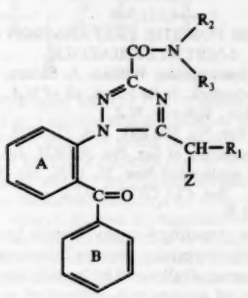
4,111,950
TRIAZOLYL BENZOPHENONES

André Gagneux, Basel; Roland Heckendorn, Arlesheim, and René Meier, Buus, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 535,480, Dec. 23, 1974, Pat. No. 4,027,029, which is a division of Ser. No. 328,815, Jan. 31, 1973, Pat. No. 3,870,714. This application Feb. 4, 1977, Ser. No. 765,573
Claims priority, application Switzerland, Feb. 7, 1972, 1738/72; Aug. 31, 1972, 12843/72; Nov. 3, 1972, 16045/72
Int. Cl.[2] C07D 401/06, 403/06, 413/06, 487/04
U.S. Cl. 260—308 R 7 Claims

1. A compound of the formula IV

(IV)



wherein

Z is hydroxy, chloro or iodo,

R_1 represents hydrogen, or an alkyl group having 1 to 3 carbon atoms, and

R_2 and R_3 independently of each other, represent hydrogen, alkyl groups having 1 to 6 carbon atoms, or hydroxyalkyl groups having in all 4 to 7 carbon atoms, or aralkyl groups having 7 to 9 carbon atoms, or together with the adjacent nitrogen atom, the 1-pyrrolidinyl-, piperidino-, 4-methyl-1-piperazinyl, or morpholino group;

wherein each of the rings A and B independently of the other, is unsubstituted or substituted by one member of the group consisting of halogen up to atomic number 35, trifluoromethyl or nitro groups, and its salts.

4,111,951
PROCESS FOR L-3,4-DEHYDROPROLINE

Urs Oskar Hengartner, Roseland, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 17, 1977, Ser. No. 759,702
Int. Cl.[2] C07D 207/22
U.S. Cl. 260—326.2 3 Claims

1. An improved process for preparing L-3,4-dehydroproline from D,L-3,4-dehydroproline which process comprises the following steps in combination:

(A) reacting D,L-3,4-dehydroproline with (+) tartaric acid in water to form the diastereomeric salts D-3,4-dehydroproline.(+) tartaric acid salt and L-3,4-dehydroproline.(+) tartaric acid salt;

(B) selectively crystallizing the L-3,4-dehydroproline.(+) tartaric acid salt;

(C) thermally racemizing the mother liquors from step (B) at a temperature in the range between about 50°–150° C so as to produce additional L-3,4-dehydroproline.(+) tartaric acid salt which is selectively crystallized; and

(D) decomposing the L-3,4-dehydroproline.(+) tartaric acid produced in steps (B) and (C) so as to yield the desired L-3,4-dehydroproline.

4,111,952
PROCESS FOR PREPARING LOWER LACTAMS FROM ALLYLIC AMINE SUBSTRATES

John F. Knifton, Austin, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,018
Int. Cl.[2] C07D 201/02, 207/26
U.S. Cl. 260—326.5 FN 10 Claims

1. The process of preparing γ-butyrolactam or an alkyl-substituted-γbutyrolactam by the carbonylation of allylic amines having three to ten carbon atoms according to the procedure of:

(a) Admixing said allylic amines to be carbonylated to γ-butyrolactam or an alkyl-substituted-γ-butyrolactam with at least a catalytic amount of rhodium catalyst complexes selected from the group consisting of:
chlorobis(ethylene)rhodium(I) dimer
Chlorotris(triphenylphosphine)rhodium(I)
Chlorocarbonylbis(triphenylphosphine)rhodium(I)
Rhodium tris(acetylacetonate)
Rhodium chloride plus triphenylphosphine and
Rhodium chloride to form a reaction mixture.

(b) Pressurizing said reaction mixture with at least sufficient carbon monoxide to satisfy the stoichiometry of the carbonylation to the γ-butyrolactam or an alkyl-substituted-γ-butyrolactam.

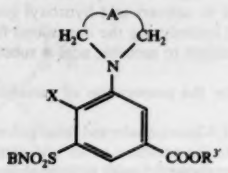
(c) Heating said pressurized reaction mixture between 20° C. and 150° C. until substantial carbonylation of the allylic amine to said γ-butyrolactam or an alkyl-subtituted-γ-butyrolactam has taken place, and isolating said γ-butyrolactam or an alkyl-substituted-γ-butyrolactam prepared therein.

4,111,953
DERIVATIVES OF 5-AMINOBENZOIC ACID HAVING A HETEROCYCLIC SUBSTITUENT IN THE 3-POSITION

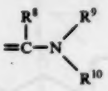
Dieter Bormann, Kelkheim, Taunus; Wulf Merkel, Neuenhain, Taunus, and Dieter Mania, Kelkheim, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 570,649, Apr. 23, 1975, Pat. No. 4,010,273.
This application Dec. 6, 1976, Ser. No. 747,489
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1974, 2419970
Int. Cl.² C07D *207/06*
U.S. Cl. 260—326.41 2 Claims

1. A compound of the formula



wherein $R^{3'}$ is hydrogen or alkyl having 1 to 4 carbon atoms; A is —CH=CH—, alkylene having 2 or 3 carbon atoms, or alkylene having 2 or 3 carbon atoms which is substituted by halogen or alkyl having 1 to 4 carbon atoms; X is halogen, $-CF_3$, $—CCl_3$, alkyl or alkoxy having up to 6 carbon atoms, benzyl, or benzyl substituted by halogen, hydroxy, amino, or by alkyl or alkoxy having 1 to 4 carbon atoms, or X is $—OR^4$, $—SR^4$, $—SOR^4$, $—SO_2R^4$, or $—NR^4R^5$ wherein R^4 is alkyl having 1 to 4 carbon atoms, phenylalkyl wherein the alkyl has 1 to 4 carbon atoms, phenyl or phenyl substituted by halogen, hydroxy, amino, $—CF_3$, nitro, alkyl or alkoxy having 1 to 4 carbon atoms, or by $—SO_2NH_2$, and R^5 is hydrogen or alkyl having 1 to 4 carbon atoms; and B is



wherein R^8, R^9, and R^{10} are the same or different lower alkyl having 1 to 4 carbon atoms and R^8 may also be hydrogen, and wherein two of R^8, R^9, and R^{10} may be bound to each other to form a 5-membered or 6-membered ring.

4,111,954
PREPARATION OF 1-METHYLPYRROLE-2-ACETONITRILE

John Robert Carson, Norristown; Richard J. Carmosin, Philadelphia, and Anthony T. Stefanski, Fort Washington, all of Pa., assignors to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Filed Apr. 20, 1977, Ser. No. 789,309
Int. Cl.² C07D *207/34*
U.S. Cl. 260—326.62 6 Claims

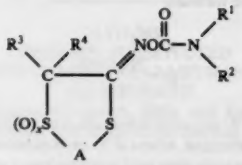
1. A process of preparing 1-loweralkyl- pyrrole-2-acetonitrile which comprises the step of reducing α-imino-1-loweralkylpyrrole-2-acetonitrile by the action of hydrogen sulfide as the reducing agent in an inert organic solvent at a temperature from about −20° to about 50° C and a pressure from atmospheric pressure to about 60 p.s.i. pressure.

4,111,955
N-TRIHALOMETHANESULFENYL CARBAMOYLOXIMINO DI-SULFUR HETEROCYCLIC COMPOUNDS

John Apling Durden, and Themistocles Damasceno Joaquim D'Silva, both of, S. Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 364,138, May 25, 1923, Pat. No. 3,992,549.
This application May 20, 1976, Ser. No. 688,222
Int. Cl.² C07D *339/00, 339/06, 339/08*
U.S. Cl. 260—327 M 14 Claims

1. A compound of the formula:



wherein:

R^1 is lower alkyl having from 1 to 4 carbon atoms, phenyl, or phenyl substituted with one or more halogen, acylamido, methylthio, methoxy, or alkyl substituents having from 1 to 4 carbon atoms or a methylenedioxy group attached to adjacent carbon atoms of said phenyl;

R^2 is trihalomethanesulfenyl;

R^3 and R^4 may be the same or different and are hydrogen, lower alkyl having from 1 to 6 carbon atoms, lower alkenyl having from 2 to 6 carbon atoms, halogen substituted alkyl having from 1 to 6 carbon atoms, alkoxyalkyl having a total of from 2 to 6 carbon atoms, alkylthioalkyl, alkylsulfinylalkyl, or alkylsulfonylalkyl, having a total of from 2 to 6 carbon atoms, phenyl or phenyl substituted with one or more halogen, methoxy or lower alkyl substituents having from 1 to 4 carbon atoms;

A is methylene, ethylene, propylene, ethenylene, propenylene or methylene, ethylene, propylene, ethenylene or propenylene substituted with one or more alkyl groups having from 1 to 3 carbon atoms; and

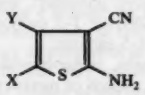
x is 0, 1 or 2.

4,111,956
PROCESS FOR THE MANUFACTURE OF HETEROCYCLIC COMPOUNDS

David Boyd Baird; James Stanley Campbell; Brian Ribbons Fishwick, and Robert David McClelland, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 630,897, Nov. 11, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,457
Int. Cl.² C07D *333/36*
U.S. Cl. 260—329 AM 3 Claims

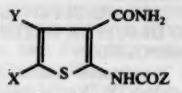
1. Process for the manufacture of the thiophene compounds of the formula:



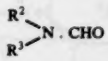
wherein

Y is selected from the class consisting of hydrogen, lower alkyl and phenyl; and

X is selected from the class consisting of nitro, cyano and phenyl, which comprises reacting a compound of the formula:


Formula I

wherein Y and X have the meanings stated and Z is selected from the class consisting of hydrogen, lower alkyl and phenyl, with from 1 to 3 moles per mol of the compound of the formula I of an acid halide selected from the class consisting of phosphorus oxychloride and thionyl chloride in the presence of from 5 to 35 moles per mol of the compound of formula I of a compound of the formula:



wherein R^2 and R^3 are each lower alkyl or R^2 and R^3 together form with the nitrogen atoms a 5- or 6-membered nitrogen-containing hetercyclic ring, said reaction being carried out at a temperature from 40° to 80° C., and subjecting the resulting compound to hydrolysis by heating it in a medium comprising water, at least one alcohol selected from the class consisting of ethanol, β-methoxyethanol, β-ethoxyethanol and n-propanol and an acid selected from the class consisting of hydrochloric acid and sulphuric acid.

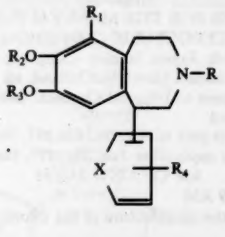
4,111,957

SUBSTITUTED 1-THIENYL AND FURYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE COMPOUNDS

Kenneth George Holden, Haddonfield, N.J., and Nelson Chi-Fai Yim, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 2, 1977, Ser. No. 764,672
Int. Cl.² C07D *333/24, 333/16;* A01N *9/00*
U.S. Cl. 260—332.2 C **8 Claims**

1. A compound of the formula:



in which:

R is hydrogen, benzyl, phenethyl, lower alkanoyl of 1–5 carbons, lower alkyl of 1–5 carbons, hydroxyethyl or lower alkenyl of 3–5 carbons;

R_1 is hydrogen, halo, trifluoromethyl, methylthio, trifluoromethylthio, methyl or methoxy;

R_2 and R_3 are each hydrogen, lower alkyl of 1–5 carbons, lower alkanoyl of 2–5 carbons or, when taken together, methylene or ethylene;

R_4 is hydrogen, halo, cyanomethyl, methyl or carbomethoxy; and

X is —S—;

and the pharmaceutically acceptable nontoxic salts thereof.

4,111,958

ASCORBIC ACID SYNTHESIS

Thomas C. Crawford, Norwich, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,020
Int. Cl.² C07D *307/32, 319/04*
U.S. Cl. 260—340.7 **26 Claims**

1. A process for the preparation of ascorbic acid which comprises

(a) contacting a 1,4-lactone selected from gulonolactone, galactonolactone, idonolactone and talonolactone with about three equivalents of a hydroxyl-protecting reagent per mole of 1,4-lactone;

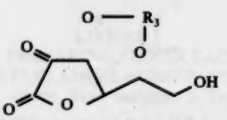
(b) contacting the resulting intermediate having a free hydroxyl group at the 2- or 3- position with an oxidizing agent effective to convert said hydroxyl group to a keto group; and (c) hydrolyzing the compound formed in step (b) until conversion to ascorbic acid is substantially complete.

17. A process for the preparation of ascorbic acid which comprises

(a) contacting a 1,4-lactone selected from gulonolactone and idonolactone in the presence of an acid catalyst having a pk_a of less than about 2.5 with at least about two equivalents of a hydroxyl-protecting reagent per mole of 1,4-lactone, said reagent being selected from an alkyl aldehyde of 2 to 8 carbon atoms; an aryl aldehyde, an arylalkyl aldehyde and an arylalkenyl aldehyde, wherein said aryl is phenyl, mono-substituted or di-substituted phenyl, wherein said substituents are alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo or nitro, and said alkyl and alkenyl are each of 2 to 4 carbon atoms;

(b) contacting the resulting intermediate having a free hydroxyl group at the 2-position with an oxidizing agent effective to convert said hydroxyl group to a keto group; and (c) hydrolyzing the compound formed in step (b) until conversion to ascorbic acid is substantially complete.

26. A compound of the formula



and the hydrated form thereof, wherein R_3 is a hydroxyl-protecting group derived from an alkyl aldehyde of 2 to 8 carbon atoms; an aryl aldehyde, an arylalkyl aldehyde or an arylalkenyl aldehyde, wherein said aryl is phenyl, mono-substituted or di-substituted phenyl, wherein said substituents are alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo or nitro, and said alkyl and alkenyl are each of 2 to 4 carbon atoms.

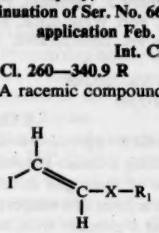
4,111,959

15,16-DIOXY PROSTENOIC ACIDS AND ESTERS AND INTERMEDIATES IN THEIR PREPARATION

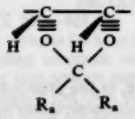
Martin Joseph Weiss, Oradell, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 663,603, Mar. 3, 1976, abandoned. This application Feb. 11, 1977, Ser. No. 767,864
Int. Cl.² C07D *317/10*
U.S. Cl. 260—340.9 R **7 Claims**

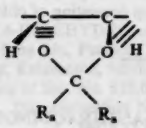
1. A racemic compound of the formula:



wherein R_1 is selected from the group consisting of propyl, butyl, pentyl, hexyl, trans-1-butenyl, trans-1-pentenyl, and trans-1-propenyl; and X is selected from the group consisting of:



(erythro)



(threo)

wherein R_a is selected from the group consisting of C_1-C_3 alkyl.

4,111,960

SUBSTITUTED DIOXOLANES AND PHOTOSENSITIVE AND DEGRADABLE POLYMERS USEFUL IN IMAGING

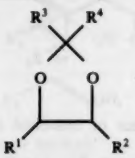
Donnie Joe Sam, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 545,603, Jan. 30, 1975, Pat. No. 3,991,033. This application Jun. 29, 1976, Ser. No. 700,968

Int. Cl.[2] C07D *317/10*

U.S. Cl. 260—340.9 R **4 Claims**

1. A compound having the formula:



wherein R^1 and R^2 are H or a phenyl group substituted with up to 5 substituents of lower alkyl or nitro, with the proviso that at least one of R^1 and R^2 is a phenyl group having an orthonitro substituent; and R^3 and R^4 are each H or lower alkyl.

4,111,961

SILICON ESTER OF CARBOXYLIC ACID

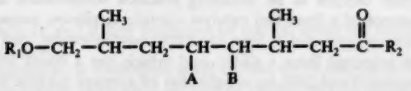
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 638,722, Dec. 8, 1975, Pat. No. 4,041,058, which is a continuation-in-part of Ser. No. 544,154, Jan. 27, 1975, abandoned. This application May 16, 1977, Ser. No. 796,930

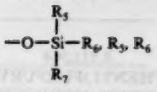
Int. Cl.[2] C07D *309/22*

U.S. Cl. 260—345.8 R **1 Claim**

1. A compound of the formula:



wherein A and B are individually hydrogen or taken together form a carbon to carbon bond; R_2



and R_7 are lower alkyl; R_1 taken together with its attached oxygen moiety forms an ether protecting group removable by acid catalyzed cleavage or hydrogenolysis; with the proviso that when R_1 is an ether protecting group removable by hydrogenanalysis, A and B form a carbon to carbon bond.

4,111,962

CERTAIN SUBSTITUTED 2-PHENYLNAPHTHO[1,2-b]FURANE AND -[2,1-b]FURANE

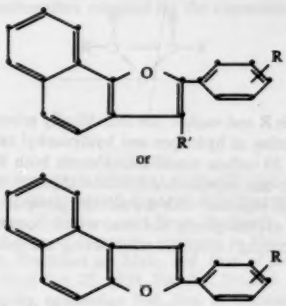
Nathan N. Crounse, Cincinnati, Ohio, and Kantilal B. Desai, Highland Heights, Ky., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 118,076, Feb. 23, 1971, Pat. No. 3,781,279. This application Sep. 19, 1973, Ser. No. 398,673

Int. Cl.[2] C07D *307/92*

U.S. Cl. 260—346.71 **7 Claims**

1. A compound of the formula



wherein R is halo and R′ is hydrogen, bromo or nitro.

4,111,963

METHOD FOR PREPARING MALEIC ANHYDRIDE

Ramon A. Mount, and Harold Raffelson, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 471,117, May 17, 1975, abandoned, which is a division of Ser. No. 330,354, Feb. 7, 1973. This application Dec. 12, 1975, Ser. No. 640,121

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 **3 Claims**

1. A method for the preparation of maleic anhydride which comprises passing saturated hydrocarbons containing 4 to 10 carbon atoms, having at least 4 carbon atoms in a straight chain, at temperatures of from about 350° C. to about 600° C. through a phosphorus-vanadium-oxygen catalyst having a phosphorus to vanadium atom ratio in the range of about 1:2 to 2:1, the catalyst having a porosity of at least about 35% as measured by the apparent density of said catalyst (in gm/cc) as determined by mercury displacement at standard atmospheric pressure, multiplied by the pore volume of said catalyst (in cc/gm) determined by volume of mercury forced into pores of said catalyst under a pressure of 15,000 pounds per square inch, prepared by the steps which comprise:

(A) contacting vanadium and phosphorus compounds under conditions which will provide a catalyst precursor wherein greater than 50 atom percent of the vanadium is tetravalent vanadium;

(B) recovering the catalyst precursor;

(C) forming the catalyst precursor into structures; and

(D) calcining the catalyst precursors.

4,111,964
3-[5-(4-NITROPHENYL)FURFURYLAMINO)]-1,2-PROPANEDIOL HYDROCHLORIDE

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Sep. 27, 1977, Ser. No. 837,029
Int. Cl.[2] C07D *307/70*
U.S. Cl. 260—347.7 **1 Claim**

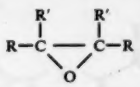
1. The compound 3-[5-(4-nitrophenyl)furfurylamino]-1,2-propanediol hydrochloride.

4,111,965
PREPARATION OF VICINAL EPOXIDES

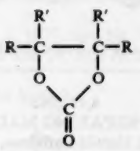
Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 459,628, Apr. 10, 1974, Pat. No. 4,069,234. This application Oct. 25, 1977, Ser. No. 845,183
Int. Cl.[2] C07D *301/02*
U.S. Cl. 260—348.16 **8 Claims**

1. A process for the preparation of a vicinal epoxide having 2 to 30 carbon atoms per molecule of the general formula

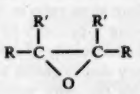


wherein each R and each R′ are individually selected from the group consisting of hydrogen and hydrocarbyl radical groups having 1 to 10 carbon atoms and wherein both R′ radicals in said epoxide can represent a divalent aliphatic hydrocarbon radical which together with the oxirane group in said epoxide can form a cycloaliphatic nucleus, which comprises heating the corresponding carbonate ester having the general formula



wherein R and R′ are as defined above, in the presence of a catalytic amount of a sulfonium halide catalyst having the formula R''_3SX wherein R″ is selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkenyl, cycloalkenyl and combinations thereof having 1 to 10 carbon atoms and *X* is selected from the group consisting of chlorine, bromine and iodine.

5. A process for the preparation of a vicinal epoxide having 2 to 30 carbon atoms per molecule of the general formula



wherein each R and each R′ are individually selected from the group consisting of hydrogen and hydrocarbyl radical groups having 1 to 10 carbon atoms and wherein both R′ radicals in said epoxide can represent a divalent aliphatic hydrocarbon radical which together with the oxirane group in said epoxide can form a cycloaliphatic nucleus, which comprises heating the corresponding carbonate ester having the general formula

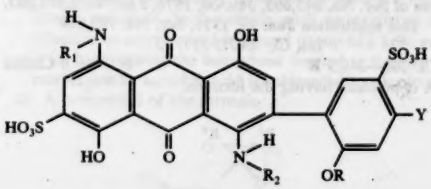
wherein R and R′ are as defined above, in the presence of a catalytic amount of a sulfoxonium halide catalyst having the formula $(R''_3S{\rightarrow}O)+X-$ wherein R″ is selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkenyl, cycloalkenyl and combinations thereof having 1 to 10 carbon atoms and *X* is selected from the group consisting of chlorine, bromine and iodine.

4,111,966
1,5-DIHYDROXY-4,8-DIAMINO-ANTHRAQUINONE COMPOUNDS ARYLATED IN 3-POSITION

Peter Hindermann, Bottmingen, Switzerland; Jean-Marie Adam, Saint-Louis, France, and Urs Karlen, Magden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,201
Claims priority, application Switzerland, Dec. 23, 1975, 16695/75
Int. Cl.[2] C07C *49/68*; C09B *1/12*
U.S. Cl. 260—373 **6 Claims**

1. Anthraquinone compounds of the formula IV



(IV)

wherein

Y represents a linear or branched alkyl group of 1 to 5 carbon atoms,

R represents a hydrogen atom, an unsubstituted or substituted alkyl group of 1 to 5 carbon atoms or the cyclohexyl group, and each of

R_1 and R_2 independently represents a hydrogen atom, the methyl, ethyl or iso-propyl group.

4,111,967
SILICON CONTAINING CATALYSTS

Manfred Martin, Cologne; Walter Schmidt, and Gerhard Scharfe, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 624,499, Oct. 21, 1975, abandoned. This application Jan. 13, 1977, Ser. No. 759,222
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1974, 2453232
Int. Cl.[2] C07C *49/66*
U.S. Cl. 260—396 R **10 Claims**

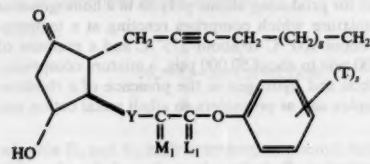
1. Process for the catalytic oxidation of naphthalene to naphthoquinone comprising contacting naphthalene with molecular oxygen at an oxidizing reaction temperature in the presence of a fixed bed catalyst containing silicon, vanadium, sulfur, oxygen and at least one alkali metal element, said catalyst prepared from a silicic acid which has a water content between 0 and 20% by weight, has an average particle size of less than 50 microns and an alkali metal content of less than 2% by weight, calculated as Na_2O and expressed relative to anhydrous silicic acid.

4,111,968
PROCESS
Edward J. Hessler, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 692,947, Jun. 4, 1976, Pat. No. 4,046,800, which is a division of Ser. No. 546,074, Jan. 31, 1975, Pat. No. 3,978,042. This application Jul. 29, 1977, Ser. No. 820,220
Int. Cl.[2] C07C *120/00, 121/34*
U.S. Cl. 260—465.6 **3 Claims**

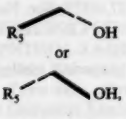
1. A process for selectively preparing a salt which comprises contacting isoxazole with a base of a strength equal to or greater than sodium methoxide in an inert organic solvent at a temperature less than or equal to about −40° C., the anion of said salt being the anion of cis-1-cyano-2-hydroxyethylene and the cation of said salt being the positive portion of said base.

4,111,969
5,6-DIDEHYDRO-ω-PHENOXY-PGE$_2$ ANALOGS
Chiu-Hong Lin, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 619,077, Oct. 2, 1975, Pat. No. 4,013,695. This application Nov. 4, 1976, Ser. No. 738,716
Int. Cl.[2] C07C *65/22, 177/00*
U.S. Cl. 260—410.9 R **24 Claims**

1. A prostaglandin analog of the formula

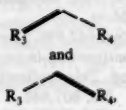


wherein *g* is one, 2, or 3;
wherein Y is trans-CH=CH-;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and *s* is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein L_1 is

or a mixture of



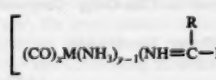
wherein R_3 and R_4 are hydrogen or methyl being the same or different; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,111,970
METHOD OF PRODUCING CHROMIUM (III)-N-ACYL-ANTHRANILATES
Dirk Jan Zwaneburg, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 13, 1977, Ser. No. 805,788
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627615
Int. Cl.[2] C01F *11/00*
U.S. Cl. 260—438.5 R **2 Claims**

1. A method of producing chromium (III)-N-acyl anthranilate dispersions for electrophotographically applying solid particles to surfaces, comprising reacting a N-acyl-anthranilic acid in a methanol solution in the presence of sodium methanolate with a chromium (III)-salt, dissolving the resulting precipitate in toluene, distilling off about 10% of the toluene in vacuum and adding sufficient fresh toluene to the remaining solution, after filtering, to provide the concentration of chromium (III)-N-acylanthranilate required for the dispersion.

4,111,971
PROCESS FOR THE MANUFACTURE OF METAL-AZOMETHINE COMPLEX COMPOUNDS
Dieter Sellmann, Paderborn, and Ernst Thallmair, Baierbrunn, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfort am Main, Fed. Rep. of Germany
Filed Oct. 27, 1976, Ser. No. 736,080
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1975, 2548330
Int. Cl.[2] C07F *11/00, 9/00, 13/00, 15/00*
U.S. Cl. 260—438.5 R **13 Claims**

1. A process for the manufacture of azomethine metal complex compounds having the formula



in which
n is an integer of from −3 to +3
M is an element of subgroups V to VIII of the periodic table
y is the integer 1
x is an integer of from 0 to +5 and 4 is less than or equal to $(x+y)$ which is less than or equal to 6
R is an aromatic radical or an alkyl radical having from 1 to 15 carbon atoms
R′ is an aromatic radical or an alkyl radical having from 1 to 15 carbon atoms or hydrogen, which comprises condensing a metal ammonia complex of the formula

$$[(CO)_xM(NH_3)_y]^n$$

with a carbonyl compound of the formula R—CO—R′ where R and R′ are as defined above or where the group R—CO—R′ is an aliphatic cyclic ketone having 5 to 7 carbon atoms.

4,111,972

ORGANOPHOSPHORUS NICKEL COMPLEXES AND USE THEREOF

Darryl R. Fahey, and John E. Mahan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 684,350, May 7, 1976. This application Dec. 8, 1977, Ser. No. 858,600
Int. Cl.[2] C07F *15/04*
U.S. Cl. 260—439 R 4 Claims

1. A process of preparing bis(μ-diphenylphosphido)tris(triethylphosphine)dinickel comprising reacting a mixture of suitable amounts of tetrakis(triethylphosphine)nickel(O) and pentafluorophenyldiphenylphosphine in a suitable diluent at a suitable temperature under an inert atmosphere and a pressure which maintains the reaction mixture essentially in the liquid phase.

4,111,973

PROCESS FOR PRODUCING A CYCLOTRISILOXANE IN A CRACKING REACTION

Ben A. Bluestein, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 1, 1977, Ser. No. 856,425
Int. Cl.[2] C07F *7/08*
U.S. Cl. 260—448.2 E 16 Claims

1. A process for improving the yield and purity of a cyclotrisiloxane of the formula,

$$(R\,R'\,Si\,O)_3$$

where R is selected from the class consisting of an alkyl radical of 1 to 8 carbon atoms cycloalkyl radicals of up to 8 carbon atoms and alkenyl radicals of 2 to 8 carbon atoms and R′ is a fluoroalkyl radical of 3 to 8 carbon atoms comprising adding to a diorganodihalosilane hydrolyzate or a mixture of cyclopolysiloxanes, an effective amount of an alkali metal hydroxide, and an effective amount of a promoting additive selected from the class consisting of aliphatic alcohols, salts of aliphatic alcohols and aliphatic alcohols containing aliphatic unsaturation wherein such additives have from fourteen to thirty carbon atoms, where the organo groups are the same as R and R′; and heating the resulting mixture at a temperature above 100° C.

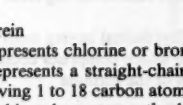
4,111,974

PROCESS FOR THE PRODUCTION OF ALKOXY-β-HALOGENOETHYLSILANES

Zdenek Mazour, Frenkendorf, and Francis Louis Dayer, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

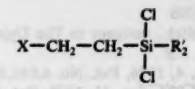
Filed Jan. 28, 1977, Ser. No. 763,458
Int. Cl.[2] C07F *7/18*
U.S. Cl. 260—448.8 R 12 Claims

1. Process for the production of alkoxy-β-halogenoethylsilanes of the formula I



(I)

wherein
X represents chlorine or bromine,
R_1 represents a straight-chain or branched-chain alkyl group having 1 to 18 carbon atoms, an alkoxyalkyl group having 3 to 14 carbon atoms, the benzyl group or a benzyl group mono- or disubstituted by an alkoxy group having 1–4 carbon atoms, and
R_2 represents methyl or R_1O—,
by reaction of a β-halogenoethylchlorosilane of the formula II



(II)

wherein R'_2 represents methyl or chlorine and X has the meaning given under formula I, with an alcohol of the formula III

$$R_1OH \qquad \text{(III)}$$

wherein R_1 has the meaning given under formula I, which process comprises carrying out the reaction of a β-halogenoethylchlorosilane of the formula II with an alcohol of the formula III in the presence of ammonia.

4,111,975

CATALYTIC PROCESS FOR PRODUCING POLYHYDRIC ALCOHOLS AND DERIVATIVES

James Norman Cawse, and Jose Luis Vidal, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,986
Int. Cl.[2] C07C *27/06*
U.S. Cl. 260—449 L 11 Claims

1. A process for producing alkane polyols in a homogeneous liquid phase mixture which comprises reacting at a temperature of from about 100° C to about 375° C and a pressure of from about 500 psia to about 50,000 psia, a mixture comprising oxides of carbon and hydrogen in the presence of a rhodium carbonyl complex and as promoters an alkali metal cation and a cryptand.

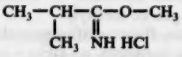
4,111,976

PROCESS FOR THE PREPARATION OF METHYLIMINOISOBUTYRATE HYDROCHLORIDE

David E. Balke, and Donald E. Perez, both of Mobile, Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 27, 1977, Ser. No. 865,099
Int. Cl.[2] C07C *119/18*
U.S. Cl. 260—453 RW 9 Claims

1. In the process for preparing methyliminoisobutyrate hydrochloride of the formula



by reacting isobutyronitrile, hydrogen chloride and methanol in the presence of excess hydrogen chloride, the improvement which comprises adding the isobutyronitrile and hydrogen chloride at a temperature of from about 5° to 25° C. to a methanolic solution containing excess hydrogen chloride and maintaining during the reaction a methanolic reaction medium saturated with hydrogen chloride.

4,111,977

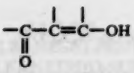
FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 642,994, Dec. 22, 1975, Pat. No. 4,069,201, which is a continuation-in-part of Ser. No. 429,164, Dec. 28, 1973, abandoned. This application Jun. 17, 1977, Ser. No. 807,448
Int. Cl.[2] C08K *5/04*
U.S. Cl. 260—45.95 R 13 Claims

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of an additive selected from the group consisting of the metal salt of unsubstituted and halogenated

oxocarbon acids, and mixtures thereof, wherein said metal salts thereof are selected from the group consisting of alkali metals and alkaline earth metals, and mixtures thereof, and said halogen is selected from fluorine, chlorine and bromine, and said oxocarbon acids are characterized by having the moiety



forming a cyclic non-aromatic ring in their structure.

4,111,978

CYANOMETHYLTHIOACETYLCEPHALOSPORIN INTERMEDIATES

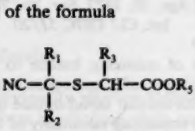
Hermann Breuer, and Uwe Treuner, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 513,674, Oct. 10, 1974, abandoned, which is a division of Ser. No. 278,168, Aug. 4, 1972, Pat. No. 3,855,212. This application Sep. 1, 1977, Ser. No. 829,707

Int. Cl.² C07C *121/16, 121/66*

U.S. Cl. 260—465 D **8 Claims**

1. A compound of the formula



wherein R_1 and R_2 each is hydrogen, phenyl, hydroxyphenyl, chlorophenyl, benzyl or phenethyl; R_3 is hydrogen, phenyl, hydroxyphenyl, aminophenyl, chlorophenyl or benzyl; with the proviso that at least one of R_1, R_2 and R_3 is other than hydrogen; and R_5 is hydrogen or lower alkyl.

4,111,979

PROCESS FOR PRODUCING 8-AMINO-1-NAPHTHOL-3,6-DISULFONIC ACID

Norio Kotera, Amagasaki; Hiromichi Okabe, Hirakata, and Hiroshi Korenaga, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 16, 1977, Ser. No. 807,187

Claims priority, application Japan, Jun. 21, 1976, 51-73723

Int. Cl.² C07C *143/30*

U.S. Cl. 260—509 **9 Claims**

1. In the process for producing 8-amino-1-naphthol-3,6-disulfonic acid from naphthalene by trisulfonation, nitration, reduction, alkali fusion and acidification precipitation, the improvement comprising acidifying the alkali fusion mixture with the nitration reaction mixture to precipitate the partial alkali metal salt of 8-amino-1-naphthol-3,6-disulfonic acid which is separated by filtration, and using the resulting filtrate containing 1-nitronaphthalene-3,6,8-trisulfonic acid and/or salt as the starting material for the reduction reaction.

4,111,980

PROCESS FOR PREPARING OPTICALLY ACTIVE PHENYL GLYCINE

Wilhelmus H. J. Boesten, Sittard, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Mar. 9, 1977, Ser. No. 775,942

Claims priority, application Netherlands, Mar. 11, 1976, 7602544

Int. Cl.² C07C *99/00*

U.S. Cl. 562—401 **3 Claims**

1. In a process for preparing optically active phenyl glycine, in which racemic phenyl glycine is prepared and then optically resolved by treatment with an optically active camphor sulphonic acid, the improvement consisting essentially in treating a racemic phenyl glycine amide solution with an optically active camphor sulphonic acid solution, thereby simultaneously hydrolizing said racemic phenyl glycine amide and forming the diastereo-isomeric salts of phenyl glycine and said optically active camphor sulphonic acid, thereafter separating an enantiomer of the phenyl glycine-camphor sulphonic acid salt, and recovering the optically active phenylglycine enantiomorph therefrom by neutralization.

4,111,981

INTERMEDIATES FOR PREPARING SUBSTITUTED PHENYLGLYCYLCEPHALOSPORINS

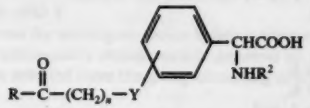
John Gerald Gleason, Cornwells Heights, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Division of Ser. No. 641,064, Dec. 15, 1975, Pat. No. 4,044,047, which is a division of Ser. No. 384,771, Aug. 1, 1973, Pat. No. 3,953,439. This application Apr. 28, 1977, Ser. No. 791,808

Int. Cl.² C07C *101/04, 101/20, 101/24*

U.S. Cl. 562—444 **6 Claims**

1. A compound of the formula:



in which:

Y is O or NH;

n is one to five;

R is NH_2 or OH; and

R^2 is hydrogen.

4,111,982

COPRODUCTION OF ACETIC AND PROPIONIC ACIDS

Lloyd S. Eubanks, and Jerry L. Price, both of Texas City, Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 26, 1976, Ser. No. 708,670

Int. Cl.² C07C *51/12, 51/14*

U.S. Cl. 562—519 **7 Claims**

1. In a process whereby acetic and propionic acids are continuously and simultaneously produced by continuously contacting in a single reactor methanol, ethylene, water and carbon monoxide with a liquid reaction medium and a catalyst system consisting essentially of a rhodium compound and a halogen component which is iodine or an iodide compound at a temperature from about 50° to about 300° C and a partial pressure of carbon monoxide in the range from 1 to 1056 kg/cm^2, the improvement which comprises proportions molar proportins of methanol, ethylene and water from 1:5:5 to 100:1:1 and controlling the rate of introduction of methanol at or below

$$5 \times 10^{10} e^{-7830/T}[R][I]$$

gram-moles/liter-hour, T being reaction temperature in ° Kelvin and $[R]$ and $[I]$ being the molarity of rhodium and iodine, respectively, in the reactor.

4,111,983

OXIDATION OF UNSATURATED ALDEHYDES TO UNSATURATED ACIDS

Abraham N. Kurtz, Charleston; Robert W. Cunningham, Saint Albans, both of W. Va., and Alfred W. Naumann, Monsey, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

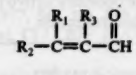
Filed Oct. 18, 1973, Ser. No. 407,577

Int. Cl.² C07C *51/32*

U.S. Cl. 562—535 **10 Claims**

1. A process for the production of unsaturated aliphatic carboxylic acid by vapor phase catalytic oxidation of the cor-

responding unsaturated aliphatic aldehyde with molecular oxygen in the presence of steam in a ratio of about 0.2 to 5 moles of oxygen and about 1 to 25 moles of steam per mole of aldehyde in the reaction mixture, said aldehyde having the structure



wherein R_1 is H or a C_1 to C_6 alkyl radical, and R_2 and R_3 are the same or different and are H or CH_3,

which comprises contacting the reaction mixture, at a temperature of from about 275° to 375° C. and at a pressure of from about 1 to 10 atmospheres, with an oxidation catalyst which has been thermally activated at a temperature of about 350° C. to 450° C. for about 2–24 hours in an atmosphere containing ammonia and which comprises a calcined composition containing the elements Mo, V, W, Cr and Cu in the ratio

$$Mo_aV_bW_cCr_dCu_e$$

wherein

a is 12,
b is 1 to 6,
c is 1 to 6,
d is 0 to 2, and
e is 1 to 4.

4,111,984

PROCESS FOR PRODUCING UNSATURATED ALDEHYDES, AND UNSATURATED FATTY ACIDS

Hiromichi Ishii; Hideo Matsuzawa; Masao Kobayashi, all of Ohtake, and Kantaro Yamada, Yokohama, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 474,218, May 29, 1974, Pat. No. 3,972,920. This application Mar. 16, 1976, Ser. No. 667,371

Claims priority, application Japan, Jun. 11, 1973, 48-65563; Aug. 28, 1973, 48-96345; Dec. 18, 1973, 48-142118; Dec. 26, 1973, 49-144000

The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.

Int. Cl.[2] C07C *51/24, 51/32*

U.S. Cl. 562—538 **6 Claims**

1. In a process for the gas phase catalytic oxidation of t-butyl alcohol in the presence of molecular oxygen at 200° C to 450° C to produce mixtures of the corresponding aldehyde and acid, the improvement comprising: oxidizing said compound over a calcined catalyst consisting essentially of $Mo_aSb_bBi_cFe_d$. $Ni_eSn_fX_gY_hO_i$ wherein X is at least one alkali metal selected from the group consisting of potassium, rubidium and cesium, Y is at least one metal selected from the group consisting of cobalt, uranium, germanium, tungsten and titanium, and *a* to *h* are atomic ratios wherein $a = 12$, $b = 0.2$ to 20, $c = 0.2$ to 12, $d = 0.2$ to 12, $e = 0.2$ to 12, $f = 0$ to 20, $g = 0.01$ to 4 and $h = 0$ to 6, and *i* is determined according to the oxidation states of the metal atoms in the catalyst.

4,111,985

PROCESS FOR PRODUCING UNSATURATED ALDEHYDES AND UNSATURATED CARBOXYLIC ACIDS

Kazuya Okada; Hideo Matsuzawa; Hiromichi Ishii, and Masao Kobayashi, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 663,365, Mar. 3, 1976, Pat. No. 4,035,418. This application Nov. 12, 1976, Ser. No. 741,508

Claims priority, application Japan, Mar. 12, 1975, 50-30313; Mar. 31, 1975, 50-39452; Jul. 4, 1975, 50-82982

Int. Cl.[2] C07C *5/00, 11/16, 45/04, 51/32*

U.S. Cl. 562—546 **6 Claims**

1. In a process for catalytically oxidizing at least one compound selected from the group consisting of unsaturated hydrocarbons with four carbon atoms in the gas phase with molecular oxygen at a temperature of 200° to 450° C to the corresponding aldehyde and acid, the improvement comprising:

oxidizing said compound over a calcined catalyst consisting essentially of

$$Mo_aSb_bBi_cFe_dNi_eCo_fSn_gX_hY_iO_j$$

wherein X is at least one metal selected from the group consisting of potassium, rubidium, cesium and thallium, and Y is at least one metal selected from the group consisting of selenium, tellurium, gallium, vanadium and ruthenium; wherein the subscripts *a* to *j* are the atomic ratios of each component and *a* is 12, $b = 0.2$ to 20, $c = 0.2$ to 12, $d = 0.2$ to 12, $e = 0.2$ to 12, $f = 0$ to 20, $g = 0$ to 20, $h = 0.01$ to 4, $i = 0.01$ to 4 and *j* is a value determined by the valencies of the elements in the catalyst.

4,111,986

BUTANE OXIDATION TO ACETIC ACID

Wilford J. Zimmerschied, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 19, 1977, Ser. No. 788,984

Int. Cl.[2] C07C *51/20*

U.S. Cl. 562—549 **7 Claims**

1. The process of oxidizing butane to acetic acid which comprises contacting a sufficient concentration of an oxygen-containing gas with normal liquid butane in the presence of a dissolved catalyst consisting essentially of bromine and cobalt in a solvent medium comprising acetic acid to initiate a self-sustaining exothermic reaction, wherein each 100 grams of butane is contacted with oxygen at a rate of at least 5 liters of oxygen per hour.

4,111,987

LITHIUM PANTOATE AND OPTICALLY ACTIVE ISOMERS THEREOF AND PROCESS OF MAKING THE SAME

Joachim Schmidt; Christian Weigelt; Wolfgang Bamberg, and Wolfgang Schneider, all of Jena, Germany, assignors to V E B Jenapharm, Jena, Germany

Continuation of Ser. No. 407,254, Oct. 17, 1973, abandoned. This application Mar. 16, 1976, Ser. No. 667,411

Int. Cl.[2] C07C *59/04*

U.S. Cl. 562—401 **2 Claims**

1. The process of making DL-lithium pantoate comprising reacting D,L-calcium pantoate and lithium oxalate in a solvent for the reactants and in amounts of the two salts to permit effecting a metathesis of the two salts, the reaction being carried out at the boiling point of the solvent, then separating the calcium oxalate from the DL-lithium pantoate and recovering the latter compound in the form of its monohydrate.

4,111,988

4-(2,2-DICHLORO-1,1-DIFLUOROETHOXYBENZENE) SULFONYL CHLORIDE AND ITS PREPARATION

George A. Burk, Bay City; Christian T. Goralski, and Craig E. Mixan, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 10, 1977, Ser. No. 758,283

Int. Cl.[2] C07C *143/70*

U.S. Cl. 260—543 R **2 Claims**

1. 4-(2,2-Dichloro-1,1-difluoroethoxybenzene)sulfonyl chloride.

2. The method of making 4-(2,2-dichloro-1,1-difluoroethoxybenzene)sulfonyl chloride by mixing together at about 10° C., an excess of phenol as such or as its alkali metal phenate with dichlorodifluoroethylene in the presence of a solvent, recovering the resulting 2,2-dichloro-1,1-difluoroethoxybenzene from the reaction medium and mixing it with excess chlorosulfonic

acid at a reaction temperature between about 0° C. and about room temperature and recovering 4-(2,2-dichloro-1,1-difluoroethoxybenzene)sulfonyl chloride from the reaction medium.

4,111,989

N-SUBSTITUTED ALKANESULFENYL-N-ALKYL AND N-SUBSTITUTED ALKANETHIO-SULFENYL-N-ALKYL CARBAMOYL HALIDE COMPOUNDS

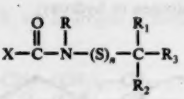
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 701,166, Jun. 30, 1976, Pat. No. 4,058,549. This application Jul. 27, 1977, Ser. No. 819,553

Int. Cl.[2] C07C *125/03, 51/58*

U.S. Cl. 260—544 C **8 Claims**

1. A compound of the formula:



wherein:

n is 1;

X is chlorine or fluorine;

R is alkyl;

R_1 and R_2 are individually alkyl or haloalkyl or R_1 and R_2 together may form an alkylene chain completing either a substituted or unsubstituted cyclopentyl, cyclohexyl or either a 6, 7 or 8 membered bicycloalkyl ring wherein the permissible substituents are one or more chloro, fluoro, bromo, alkyl or haloalkyl substituents;

R_3 is haloalkyl;

with the proviso that R, R_1, R_2 and R_3 substituents individually may not include more than eight aliphatic carbon atoms.

4,111,990

1-ACETYLAMINOTRICYCLO [4.3.1.1^{2,5}] UNDECANE AND PROCESS FOR THE PREPARATION THEREOF

Yoshiaki Inamoto; Koji Aigami; Motoyoshi Ohsugi; Yoshiaki Fujikura, and Hiroshi Ikeda, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1977, Ser. No. 839,976

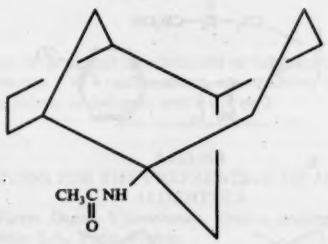
Claims priority, application Japan, Oct. 12, 1976, 51-122440

Int. Cl.[2] C07D *102/08, 103/12*

U.S. Cl. 260—561 R **4 Claims**

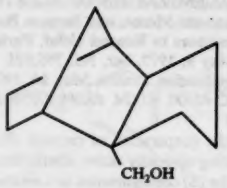
1. 1-Acetylaminotricyclo [4.3.1.1^{2,5}] undecane having the formula (I):

(I)



2. A process for preparing 1-acetylaminotricyclo [4.3.1.1^{2,5}] undecane which comprises reacting endo-2-hydroxymethyl-exo-2,3-trimethylenenorbornane of formula (III) with acetonitrile in the presence of sulfuric acid:

(III)



4,111,991

PROCESS FOR MAKING HALOGEN SALTS

James A. Garrison, Huntington Beach, Calif., assignor to Deepwater Chemical Co., Costa Mesa, Calif.

Filed May 16, 1977, Ser. No. 797,419

Int. Cl.[2] C07C *87/22*

U.S. Cl. 260—583 P **12 Claims**

1. A process for making an amine halide comprising:

reacting substantially stoichiometric amounts of elemental halogen selected from the group consisting of CL, Br and I;

a second compound selected from the group consisting of hydrazine, hydrazine hydrate, and compounds which generate hydrazine under the reaction conditions; and,

a third compound selected from the group consisting of amines and salts thereof which generate the amine under the reaction conditions;

in a reaction medium selected from the group consisting of water, alcohols, ethers and mixtures thereof.

4,111,992

PREPARATION OF FOOD COLORING AGENTS

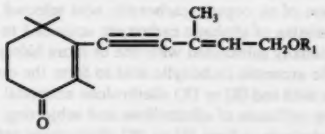
Michael Rosenberger, Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 723,416, Sep. 15, 1976, Pat. No. 4,025,564, which is a division of Ser. No. 585,224, Jun. 9, 1975, Pat. No. 4,000,198. This application Feb. 4, 1977, Ser. No. 765,570

Int. Cl.[2] C07C *49/48, 49/56, 49/60*

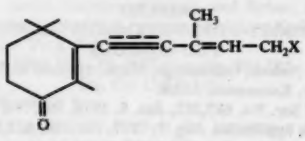
U.S. Cl. 260—586 R **5 Claims**

1. A compound of the formula



wherein R_1 is hydrogen or taken together with its attached oxygen atom forms an ether protecting group removable by hydrolysis, and the dotted bond can be optionally hydrogenated.

4. A compound of the formula



wherein X is halogen and the dotted bond can be optionally hydrogenated.

4,111,993

PROCESS FOR RACEMIZATION OF ALLETHROLONE

Charles Pavan, Nogent-sur-Marne, and Jacques Bulidon, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Filed May 9, 1977, Ser. No. 795,021
Claims priority, application France, May 14, 1976, 76 14617
Int. Cl.[2] C07C *45/00, 45/24, 49/46;* C07B *20/00*
U.S. Cl. 260—586 R **9 Claims**

1. A process for the preparation of racemic (R,S) allethrolone comprising heating optically active allethrolone of the (R) configuration or of the (S) configuration or a mixture of the (R) and (S) configurations in non-equimolecular proportions with formic acid to form the formate of racemic allethrolone of (R,S) configuration and hydrolyzing the latter in the presence of an strong acid or strong base to obtain racemic (R,S) allethrolone.

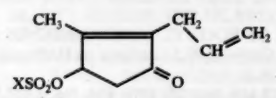
4,111,994

PREPARATION OF OPTICALLY ACTIVE ALLETHROLONE

Jacques Martel, Bondy, and Jean Tessier, Vincennes, both of France, assignors to Roussel Uclaf, Paris, France

Filed Jul. 29, 1977, Ser. No. 820,096
Claims priority, application France, Aug. 26, 1976, 76 25799
Int. Cl.[2] C07C *45/24*
U.S. Cl. 260—586 R **5 Claims**

1. A process for the preparation of optically active (S) or (R) allethrolone comprising reacting in at least one organic solvent selected from the group consisting of dimethylformamide, dimethylsulfoxide, dimethoxyethane, acetonitrile, aliphatic ketones, hexamethylphosphortriamide, alkanols and monocyclic aromatic hydrocarbons a sulfonate of optically active allethrolone of (R) or (S) configuration of the formula



wherein X is selected from the group consisting of alkyl of 1 to 3 carbon atoms and phenyl optionally substituted in the p-position with a member of the group consisting of methyl, chlorine, bromine and fluorine with a salt selected from the group consisting of alkali metal, alkaline earth metal, ammonium and a tertiary base of an organic carboxylic acid selected from the group consisting of aliphatic carboxylic acids of 1 to 6 carbon atoms optionally substituted with one or more halogens and a monocyclic aromatic carboxylic acid to form the ester of the carboxylic acid and (S) or (R) allethrolone antipodal to that of the starting sulfonate of allethrolone and subjecting the latter to acid hydrolysis to form (S) or (R) allethrolone antipodal to the starting sulfonate.

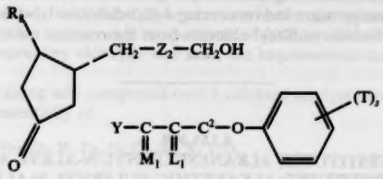
4,111,995

2-DECARBOXY-2-HYDROXYMETHYL-ω-PHENOXY-PGD ANALOGS

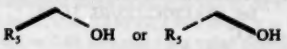
Norman A. Nelson, Galesburgh, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,299
Int. Cl.[2] C07C *49/84*
U.S. Cl. 260—590 C **83 Claims**

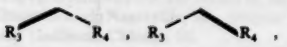
1. A prostaglandin analog of the formula



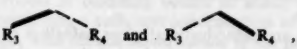
wherein R_8 is hydrogen or hydroxy;
wherein Y is trans-CH=CH—;
wherein M_1 is



wherein R_5 is hydrogen or hydroxy;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein Z_2 is
cis-CH=CH—CH_2—$(CH_2)_g$—CF_2—;
cis-CH_2—CH=CH—$(CH_2)_g$—CH_2—; or
—$(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein *g* is one, 2, or 3; and
wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

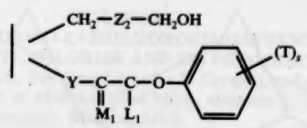
4,111,996

2-DECARBOXY-2-HYDROXY-METHYL-ω-PHENOXY-PGA OR 9-DEOXY-9,10-DIDEHYDRO-PGD ANALOGS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,303
Int. Cl.[2] C07C *49/84*
U.S. Cl. 260—590 D **83 Claims**

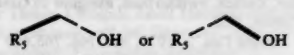
1. A prostaglandin analog of the formula



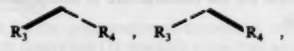
wherein | is

wherein Y is trans—CH=CH—;

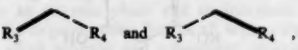
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein Z_2 is
cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—;
cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—; or —$(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein g is one, 2, or 3; and
wherein s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,111,997

BENZALICYCLIC CARBOXYLIC ACID DERIVATIVE

Shunsaku Noguchi, Osaka; Tetsuya Aono, Kyoto; Yoshiaki Araki, Osaka, and Kiyohisa Kawai, Kyoto, all of Japan, assignors to Takeda Chemical Company, Ltd., Japan

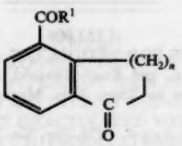
Division of Ser. No. 647,810, Jan. 9, 1976, which is a division of Ser. No. 496,855, Aug. 12, 1974, Pat. No. 3,953,500. This application Nov. 15, 1976, Ser. No. 742,111

Claims priority, application Japan, Aug. 11, 1973, 48-90274; Sep. 1, 1973, 48-98371; Sep. 13, 1973, 48-103602; Sep. 13, 1973, 48-103604; Sep. 13, 1973, 48-103605; Sep. 13, 1973, 48-103606; Oct. 31, 1973, 48-122490; May 7, 1974, 49-51034; May 24, 1974, 49-59017; May 31, 1974, 49-62300

Int. Cl.² C07C *49/76*

U.S. Cl. 260—591 **5 Claims**

1. A compound of the general formula:



wherein R^1 is phenyl unsubstituted or substituted by a lower alkyl having 1 to 4 carbon atoms, lower alkoxy having 1 to 4 carbon atoms, or halogen, and *n* is 1 or 2.

4,111,998

PROCESS FOR THE PREPARATION OF AROMATIC ALDEHYDES

Jean-Pierre Decor, Villeurbanne, France, assignor to Rhone-Poulenc S.A., Paris, France

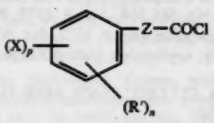
Filed Jul. 18, 1974, Ser. No. 489,715

Claims priority, application France, Jul. 20, 1973, 73 26713

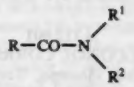
Int. Cl.² C07C *47/48*

U.S. Cl. 260—599 **11 Claims**

1. In a process for the preparation of a juxtanuclear or extranuclear aromatic aldehyde in the liquid phase which comprises effecting the catalytic reduction with hydrogen in the presence of a palladium catalyst of an acid chloride of formula:



in which *n* and *p* each independently is 0, 1 or 2, R′ is a straight or branched alkyl group with at most 4 carbon atoms, or if *n* is 2 and the two radicals R′ are adjacent, they can, taken together, form an unsaturated divalent group which has 4 carbon atoms and which, together with the two carbon atoms of the benzene ring, forms another benzene ring, X is an alkoxy or cycloalkoxy group with up to 6 carbon atoms or a phenoxy group and Z is a valency bond or a saturated or unsaturated divalent hydrocarbon radical with at most 6 carbon atoms, the improvement wherein the reduction is carried out in the presence of a tertiary amide of the formula



in which R^1 and R^2 each independently represents a straight or branched saturated aliphatic group with at most 6 carbon atoms, a cycloaliphatic group with 5 or 6 carbon atoms in the ring, a phenyl group or a phenylalkyl or alkylphenyl group in which the alkyl portion contains at most 4 carbon atoms, or R^1 and R^2 together form a saturated or unsaturated divalent radical such that the ring which they form together with the nitrogen atom to which they are attached contains 4 or 5 carbon atoms, and R represents a hydrogen atom, a straight or branched saturated aliphatic group with at most 6 carbon atoms, a cycloaliphatic group with 5 or 6 carbon atoms in the ring, a phenyl group or a phenylalkyl or alkylphenyl group in which the alkyl portion contains at most 4 carbon atoms, or R, together with one of the radicals R^1 or R^2 forms a divalent radical such that the ring which they form together with the —CO—N grouping contains 4 to 5 carbon atoms, the tertiary amide being present in an amount from 10^{-5} to 10^{-1} moles per mole of acid chloride.

4,111,999

CLEAVAGE OF SILYLATED CARBORANES AND METHOD FOR PREPARING META-CARBORANE EMPLOYING SAME

Charles D. Beard, Yorktown Heights, and Robert B. Moffitt, III, Ossining, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 865,893

Int. Cl.² C07F *5/02*

U.S. Cl. 260—606.5 B **21 Claims**

1. A highly selective method for cleaving a carboranyl carbon-silicon bond in a substrate having at least one of such bonds, without cleaving the carborane ring structure, which comprises contacting said substrate with a catalytic amount of a nucleophilic cleavage agent capable of cleaving said bond.

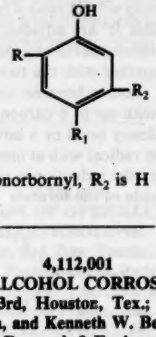
4,112,000

TERPENOPHENOLS

Jean Mardigulan, Paris, France, assignor to MAR-PHA, Societe d'Etude et d'Exploitation de Marques, France

Division of Ser. No. 566,364, Apr. 9, 1975, Pat. No. 4,067,899.
This application Jun. 6, 1977, Ser. No. 803,511
Claims priority, application United Kingdom, Apr. 11, 1974, 16142/74
Int. Cl.² C07C *39/27;* A61K *31/055*
U.S. Cl. 568—734 4 Claims

1. A terpenophenol of formula



in which R is 2-exonorbornyl, R_2 is H or methyl and R_1 is chlorine or bromine.

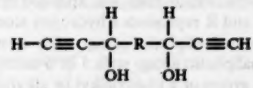
4,112,001

DIACETYLENIC ALCOHOL CORROSION INHIBITORS

Daniel S. Sullivan, 3rd, Houston, Tex.; Charles E. Strubelt, Tamare, Venezuela, and Kenneth W. Becker, Houston, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 637,302, Dec. 3, 1975, Pat. No. 4,039,336.
This application Mar. 25, 1977, Ser. No. 781,343
Int. Cl.² C07C *33/04*
U.S. Cl. 568—855 3 Claims

1. As a composition of matter an α, Ω-diacetylenic diol having the structural formula:



where R is an aliphatic or an alicyclic residue containing from 1 to 12 carbon atoms.

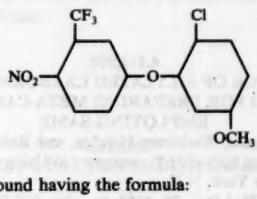
4,112,002

MONONITROTRIFLUOROMETHYL DIPHENYLETHERS

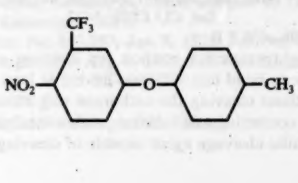
Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 760,952
Int. Cl.² C07C *43/28*
U.S. Cl. 260—612 R 2 Claims

1. A compound having the formula:



2. A compound having the formula:



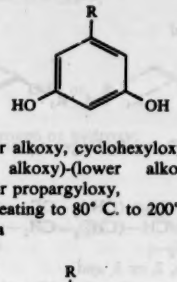
4,112,003

PROCESS FOR PREPARING POLYPHENOLS

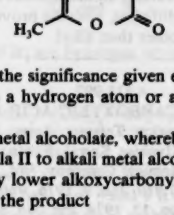
Ulrich Huber, Zurich, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Feb. 3, 1977, Ser. No. 765,495
Claims priority, application Switzerland, Feb. 12, 1976, 1709/76; Dec. 21, 1976, 16091/76
Int. Cl.² C07C *41/00*
U.S. Cl. 260—613 D 12 Claims

1. A process for the manufacture of compounds of the general formula

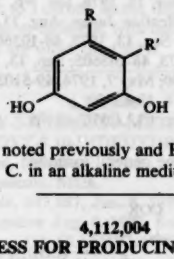


wherein R is lower alkoxy, cyclohexyloxy, benzyloxy, trityloxy, (lower alkoxy)-(lower alkoxy), 2 tetrahydropyranyloxy or propargyloxy,
which comprises heating to 80° C. to 200° C. a compound of the general formula



(II)

wherein R has the significance given earlier in this claim and R′ represents a hydrogen atom or a lower alkoxycarbonyl group,
with an alkali metal alcoholate, whereby the ratio of the compound of formula II to alkali metal alcoholate is 2:5 to 1:5, and cleaving off any lower alkoxycarbonyl group R′, if still present, by heating the product



(I)

wherein R is as noted previously and R_1 is a lower alkoxycarbonyl to 100° C. in an alkaline medium.

4,112,004

PROCESS FOR PRODUCING ALCOHOL

Shunsuke Mabuchi, and Kenji Tsuzuki, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Aug. 4, 1976, Ser. No. 711,497
Claims priority, application Japan, Aug. 11, 1975, 50-96634
Int. Cl.² C07C *29/00*
U.S. Cl. 568—861 7 Claims

1. In a process for producing a monohydric or polyhydric alcohol by the continuous hydrogenation of an organic peroxide in the presence of a nickel catalyst at a temperature of 30° to 200° C and a hydrogen pressure of 10 to 300 kg/cm², the improvement which comprises:

continuously feeding a solution of said organic peroxide and a suspended nickel catalyst into a first reactor at a ratio of the organic peroxide to the nickel catalyst of 10 : 1 to 0.1 : 1, and continuously discharging the reaction mixture and the nickel catalyst to a subsequent reactor whereby the hydrogenation is repeated, such rate of discharge being such that a constant weight and composition of the contents within each reactor are maintained.

4,112,005

PROCESS FOR THE PREPARATION OF MONONITRO-AROMATIC COMPOUNDS

Karl-Werner Thiem, Cologne; Adolf Hamers, and Josef Heinen, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 9, 1977, Ser. No. 795,249

Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622313

Int. Cl.[2] C07C *79/10, 79/12*

U.S. Cl. 260—645 16 Claims

1. Process for the preparation of mononitro-aromatic compounds which comprises (1) reacting a reactive aromatic compound with 40 to 68% strength by weight nitric acid in the absence of sulphuric acid, until mononitration is essentially complete (2) separating mechanically said nitration reaction mixture into an organic phase and an inorganic phase, (3) washing of the organic phase first of all with water and then with dilute alkali solution and subsequent separation of the unconverted starting material and of the adhering water by means of rectification (4) feeding said inorganic phase and, if necessary, the wash water of the first water wash of the organic phase, to a rectification column in which (a) water is withdrawn over the top and (b) a fraction which has a higher nitric acid content than the feed is taken off from the sump, (5) recycling said material withdrawn from the sump to the nitration reaction vessel with the addition of fresh concentrated nitric acid and (6) withdrawing from the system an amount of the top product from said column which corresponds to the water of reaction and that which enters with the nitric acid that is added.

4,112,006

PROCESS FOR NITRATING TOLUENE

Hans Schubert, Kelkheim, and Friedrich Wunder, Flörsheim, Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 15, 1977, Ser. No. 816,213

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632234

Int. Cl.[2] C07C *79/10*

U.S. Cl. 260—645 5 Claims

1. A process for the production of p-nitrotoluene which comprises reacting toluene with nitric acid in the gaseous phase under reduced pressure and at a temperature of about 80° to 180° C. in the presence of an inorganic catalyst which consists essentially of a carrier substance based on SiO_2 and/or Al_2O_3 impregnated with a high boiling inorganic acid and optionally with metal salts of such an acid.

4,112,007

SELECTIVE HYDROGENATION IN GASEOUS PHASE OF CYCLOPENTADIENE OR A MIXTURE OF ETHYLENE AND ACETYLENE USING A PALLADIUM ZINC CATALYST DEACTIVATED WITH AMMONIA, AMMONIUM CHLORIDE, STEAM, OR THEIR MIXTURES

Domenico Sanfilippo, Milan, and Morello Morelli, San Donato Milanese (Milan), both of Italy, assignors to ANIC S.p.A., Palermo, Italy

Filed May 21, 1976, Ser. No. 688,836

Claims priority, application Italy, May 23, 1975, 23666 A/75

Int. Cl.[2] C07C *5/06, 5/08*

U.S. Cl. 260—666 A 8 Claims

1. A process for the selective hydrogenation of a polyunsaturated hydrocarbon which comprises contacting a hydrocarbon selected from the group consisting of cyclopentadiene and a mixture of ethylene and acetylene with hydrogen in the gaseous state in the presence of a catalyst consisting essentially of palladium and a zinc salt and a further deactivating substance selected from the group consisting of ammonia, ammonium chloride and steam and mixtures thereof, said process being carried out at a temperature of between 20° C. and 300° C. and an absolute pressure of between 1 and 20 atmospheres.

4,112,008

PROCESS FOR ALKYLATION-TRANSALKYLATION OF AROMATIC HYDROCARBONS BY MEANS OF METHANOL

Christian Marcilly, Montesson, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 30, 1977, Ser. No. 782,880

Claims priority, application France, Mar. 30, 1976, 76 09568

Int. Cl.[2] C07C *3/52, 3/62*

U.S. Cl. 260—671 M 18 Claims

1. In a process for catalytically alkylating a charge containing from 30 to 95% by mole of toluene and 5 to 70% by mole of methanol in the presence of hydrogen, at a temperature from 100° to 600° C., under a pressure from 1 to 150 bars, with a feed space velocity, expressed in volume of charge per volume of catalyst and per hour, from 0.05 to 10, with a molar ratio H_2/charge from 0.1 to 20, wherein the improvement comprises conducting said alkylating in the presence of a catalyst having a zeolite base of the faujasite type selected from Y sieves containing less than 2% by weight of sodium and in which the molar ratio SiO_2/Al_2O_3 is from about 2 to 6, said catalyst containing at least 0.5% by weight of at least one metal selected from nickel, silver and cadmium, said catalyst having been calcined in the presence of air at 250°–650° C. and then reduced in the presence of hydrogen at 250°–550° C., said alkylating being performed in the presence of sulfur, said sulfur being introduced into the initial charge in such an amount that the latter contains from 0.001 to 5% by weight of a sulfur compound, and/or preintroduced into the catalyst in such an amount that the catalyst contains from 0.1 to 15% by weight of sulfur.

10. In a process for catalytically alkylating-transalkylating a charge containing from 20 to 95% by mole of toluene, 2 to 60% by mole of tetramethylbenzene and 2 to 20% by mole of methanol in the presence of hydrogen, at a temperature from 100° to 600° C., under a pressure from 1 to 150 bars, with a feed space velocity, expressed in volume of charge per volume of catalyst and per hour, from 0.05 to 10, with a molar ratio H_2/charge from 0.1 to 20, wherein the improvement comprises conducting said alkylating-transalkylating in the presence of a catalyst having a zeolite base of the faujasite type selected from Y sieves containing less than 2% by weight of sodium and in which the molar ratio SiO_2/Al_2O_3 is from about 2 to 6, said catalyst containing at least 0.5% by weight of at least one metal selected from nickel, silver and cadmium, said catalyst having been calcined in the presence of air at 250°–650° C. and then reduced in the presence of hydrogen at 250°–550° C., said alkylating-transalkylating being performed in the presence of sulfur, said sulfur being introduced into the initial charge in such an amount that the latter contains from 0.001 to 5% by weight of a sulfur compound, and/or preintroduced into the catalyst in such an amount that the catalyst contains from 0.1 to 15% by weight of sulfur.

4,112,009

METHOD FOR REMOVING ACETYLENIC COMPOUNDS FROM SATURATED, OLEFINIC AND DIENIC HYDROCARBONS OR MIXTURES THEREOF

Carlo Rescalli, and Antonio Pacifico, both of San Donato Milanese, Italy, assignors to Snamprogetti, S.p.A., Liman, Italy

Continuation of Ser. No. 577,691, May 21, 1975, Pat. No. 4,031,157. This application Jan. 26, 1977, Ser. No. 762,769

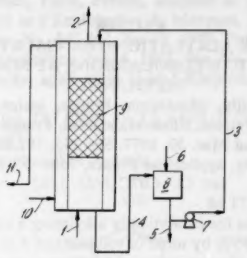
Claims priority, application Italy, May 21, 1974, 23011 A/74; Mar. 21, 1975, 215117 A/75

Int. Cl.[2] C07C *7/04*

U.S. Cl. 260—677 A 9 Claims

1. Method for removing acetylenic compounds from saturated, olefinic or dienic hydrocarbons or mixtures thereof which comprises reacting said acetylenic compounds con-

tained in the saturated, olefinic or dienic hydrocarbons or in mixtures thereof with compounds of the formula R—OH



wherein R is acetyl in the presence of an acid ion - exchange resin containing mercuric ions and thereafter removing the reaction products.

4,112,010

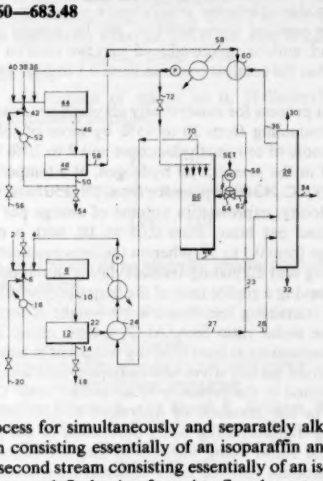
PARALLEL ALKYLATION ZONES WITH ALKYLATE PRODUCT AND PROPANE REMOVAL FROM A FLASH ZONE AND A FRACTIONATION ZONE

Rolland E. Dixon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 25, 1977, Ser. No. 800,388

Int. Cl.[2] C07C *3/54*

U.S. Cl. 260—683.48 **8 Claims**



1. A process for simultaneously and separately alkylating a first stream consisting essentially of an isoparaffin and propylene and a second stream consisting essentially of an isoparaffin and at least one olefin having from 4 to 7 carbon atoms which comprises

passing said first stream in admixture with a first portion of an acid alkylation catalyst through a first alkylation zone under alkylation conditions to form a first reaction mixture,

simultaneously passing said second stream in admixture with a second portion of said catalyst through a second alkylation zone under alkylation conditions to form a second reaction mixture,

passing said first reaction mixture to a first settling zone wherein said first reaction mixture separates into a first hydrocarbon phase and a first catalyst phase,

passing said second mixture is a second settling zone wherein said second mixture separates into a second hydrocarbon phase and a second catalyst phase,

withdrawing said first catalyst phase from said first settling zone,

withdrawing said second catalyst phase from said second settling zone,

withdrawing said first hydrocarbon phase from said first settling zone,

withdrawing said second hydrocarbon phase from said second settling zone,

dividing said first hydrocarbon phase into a first portion in an amount based on the propane to be removed from the process and a second portion,

passing said first portion of said first hydrocarbon phase to a fractionation zone,

removing said propane from said fractionation zone,

removing isoparaffin from said fractionation zone,

passing at least a major portion of said isoparaffin as recycle to said second alkylation zone,

combining said second hydrocarbon phase with said second portion of said first hydrocarbon phase,

passing the resulting combined hydrocarbon stream to a flash zone for separation therein of said combined stream into an isoparaffin-rich overhead stream and an alkylate-rich bottoms stream,

withdrawing said alkylate-rich bottoms stream from said flash zone,

passing said alkylate-rich bottoms stream to said fractionation zone,

withdrawing said isoparaffin-rich overhead stream from said flash zone,

passing said isoparaffin-rich overhead stream to said first alkylation zone, and

withdrawing an alkylate product stream from said fractionation zone.

4,112,011

OLIGOMERIZATION PROCESS

Alexander John Kolombos, Thames Ditton, England, assignor to The British Petroleum Company Limited, London, England

Filed Jun. 8, 1977, Ser. No. 804,628

Claims priority, application United Kingdom, Jun. 22, 1976, 25884/76

Int. Cl.[2] C07C *3/20*

U.S. Cl. 260—683.15 R **7 Claims**

1. A process for producing unsaturated hydrocarbons which comprises subjecting a C_3 to C_8 mono-olefinic hydrocarbon to a temperature of from about 20° to 500° C. at a pressure of from about 50 to 1500 psig in the presence of a catalyst prepared by admixing a water-soluble gallium compound with an aluminia, silica, or silica-aluminia containing surface hydroxyl groups so that at least part of the surface hydroxyl groups have been exchanged with gallium ions.

4,112,012

PULVERULENT COATING AGENTS

Eckhard de Cleur, Duisburg; Rolf Dhein, Krefeld-Bockum; Hans Rudolph, Krefeld-Bockum, and Hans Joachim Kreuder, Krefeld-Bockum, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 544,123, Jan. 27, 1975, abandoned, which is a continuation of Ser. No. 373,470, Jun. 25, 1973, abandoned. This application May 27, 1977, Ser. No. 801,074

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1972, 2232084

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—835 **11 Claims**

1. A curable pulverulent coating composition comprising (a) a polyester containing free carboxyl groups having a softening point of from 40° to 140° C. and an acid number of from 20 to 150 and being derived from at least one polyalcohol and one polycarboxylic acid which is predominantly aromatic and, as the sole crosslinking agent, (b) at least one polyglycidyl ester having an average molecular weight of from 200 to 1000 which is derived from an aromatic polycarboxylic acid, a cycloaliphatic polycarboxylic acid, an alphatic polycarboxylic acid or a mixture of at least two such acids, said (a) and (b) being

present in an amount such that 0.7–1.4 equivalents of epoxide groups are present per equivalent of carboxyl groups.

4,112,013
ADHESIVE COMPOSITION

Paul Clayton Briggs, Jr., Wilmington, and Lawrence Carl Muschiatti, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 551,964, Feb. 21, 1975, abandoned, which is a division of Ser. No. 357,387, May 4, 1974, Pat. No. 3,890,407, which is a continuation-in-part of Ser. No. 273,353, Jul. 20, 1972, abandoned. This application Feb. 18, 1977, Ser. No. 770,058

Int. Cl.[2] C08L *23/00*

U.S. Cl. 260—878 R **3 Claims**

1. A polymer-in-monomer solution suitable for use as an adhesive when combined with polymerization catalyst, which when so combined gives bonds that can be characterized by at least one of the following: the setting time is less than about 10 minutes, the T-peel strength is greater than about 5 pli, the lap shear strength on prepared surfaces is greater than about 2500 psi, and the bond strength on oily surfaces is not significantly adversely affected by the presence of the oil, said solution consisting essentially of (a) chlorosulfonated polyethylene made from branched polyethylene having a melt index of about 100, said chlorosulfonated polyethylene containing about 43% by weight chlorine and about 34 mmoles of sulfonyl chloride per 100 grams of polymer and (b) a mixture of the following acrylic monomers: methyl methacrylate, glacial methacrylic acid and ethylene glycol dimethacrylate, said solution having a Brookfield viscosity of up to about 1 million.

4,112,014
O,O′-BIS(HYDROXYALKYL) N,N-DI(LOWER-ALKYL)AMINOMETHANE PHOSPHONATES

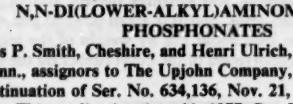
Curtis P. Smith, Cheshire, and Henri Ulrich, Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 634,136, Nov. 21, 1975, abandoned. This application Apr. 11, 1977, Ser. No. 786,690

Int. Cl.[2] C07F *9/40*; C08J *9/00*

U.S. Cl. 260—945 **4 Claims**

1. An O,O′-bis(hydroxyalkyl) N,N-di(lower-alkyl)aminomethanephosphonate having the formula:



wherein R_1, R_2, R_3, and R_4 are each independently selected from the class consisting of hydrogen and lower-alkyl, and R_5 and R_6 each independently represents lower-alkyl.

4,112,015
HUMIDIFIER DRIVE SYSTEM

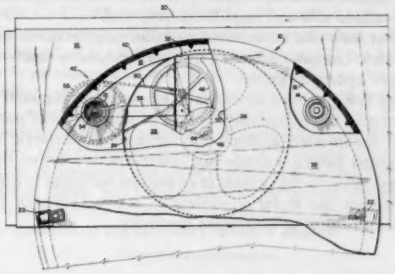
Theodore E. Tinsler, Sidney, Ohio, assignor to White-Westinghouse Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 597,527, Jul. 21, 1975, abandoned. This application Apr. 22, 1977, Ser. No. 790,012

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—92 **15 Claims**

1. In a humidifier of the type embodying a rotatable media wheel rotating on a horizontal axis so a lower sector passes through a water reservoir and in which humidifier an airflow path is provided from exterior of the humidifier to and through the water soaked portion of the rotating media wheel above the reservoir to a humidified air exhaust path from the humidifier, the improvement comprising: a humidifier interior structure having an upright division panel including a central opening providing an air flow passage to the media wheel; means, including drive roller means on the outer side of said panel, for rotatably supporting and driving said media wheel, and a drive roller driving shaft coaxially secured to said drive roller means; a rotary electric motor, said motor having a rotary motor shaft each end of which projects from respective ends of the motor; a fan mounted on and rigidly secured on one end of the motor shaft disposed concentric with and adjacent said panel opening to force air through the opening; a plural belt and pulley high



speed reduction drive system, with input and output pulleys, located on the opposite side of said panel from said media wheel with its input pulley directly secured on the other end of the motor shaft and its output pulley secured on said roller driving shaft; and means on said panel mounting said motor, said drive roller shaft and said high speed reduction drive system on said opposite side of said panel.

4,112,016
POLYAMIDE FIBER

Gordon Mars Moulds, Waynesboro, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 349,485, Apr. 9, 1973, abandoned. This application Apr. 3, 1975, Ser. No. 564,903

Int. Cl.[2] C08K *5/31, 5/34*; C08L *77/10, 61/26*

U.S. Cl. 260—849 **3 Claims**

1. A polyamide fiber selected from the group of poly(p-phenylene terephthalamide), poly(chloro-p-phenylene terephthalamide), poly(p-phenylene chloroterephthalamide), and poly(p-benzamide), said fiber containing the reaction product of 2 to 5 parts of a tetrakis(hydroxymethyl)phosphonium compound and one part of a member of the group of

(A) melamine-formaldehyde condensate;

(B) melamine-formaldehyde condensate and magnesium ammonium phosphate hexahydrate;

(C) guanidine magnesium phosphate; and

(D) guanidine phosphate;

in such an amount as to provide between 0.4 and 3.0% by weight of phosphorus.

4,112,017
RADIATION CURABLE COATING COMPOSITIONS

Dennis D. Howard, Girard, Pa., assignor to Lord Corporation, Erie, Pa.

Continuation-in-part of Ser. No. 708,155, Jul. 23, 1976. This application Aug. 2, 1976, Ser. No. 710,776

Int. Cl.[2] C08L *75/00*

U.S. Cl. 260—859 R **35 Claims**

1. Unsaturated addition-polymerizable urethane resins characterized by the presence of at least one ethylenically unsaturated terminal group having the structure $CH_2 = C<$, said unsaturated urethane resins comprising the reaction product of

(i) at least one organic isocyanate compound having at least two isocyanate groups;

(ii) at least one polyester polyol having at least two hydroxy groups, said polyester polyol comprising the reaction product of

(a) at least one glycol selected from the group consisting of 1,3-butylene glycol and neopentyl glycol;

(b) adipic acid;
(c) isophthalic acid; and
(d) zero to 50 mol percent of at least one aliphatic polyol having at least three hydroxyl groups, said mol percent being based on total moles of glycol and aliphatic polyol;
the amount of isophthalic acid being in the range from about 5 to about 25 mol percent, based on total mols of adipic acid and isophthalic acid; and
(iii) at least one unsaturated addition-polymerizable monomeric compound having a single isocyanate-reactive active hydrogen group;
there being present an excess of isocyanate compound with respect to the hydroxyl groups of said polyester polyol,
said unsaturated addition-polymerizable monomeric compound having a single isocyanate-reactive active hydrogen group being present in an amount sufficient to provide at least one molar equivalent of active hydrogen group with respect to isocyanate reactivity.

4,112,018

UNSATURATED POLYESTER RESINS SUITABLE FOR THE PRODUCTION OF CROSS-LINKED POLYESTERS WHICH ARE DIFFICULT TO SAPONIFY

Hans-Joachim Traenckner, Krefeld-Fischeln; Hans Jurgen Rosenkranz, Krefeld; Hans-Michael Fischler, Krefeld, and Erich Eimers, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 581,805, May 29, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,531

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1974, 2427275

Int. Cl.[2] C08G *63/52, 63/56;* **C08L** *67/06*

U.S. Cl. 260—861 **2 Claims**

1. Unsaturated polyester resins suitable for the production of cross-linked polyesters which are difficult to saponify containing

I. from 40 to 90% by weight of an unsaturated polyester which in turn consists of
(a) from 30 to 80% by weight of radicals of α,β-ethylenically unsaturated dicarboxylic acids, of which up to 70 mol % may be replaced by radicals of saturated dicarboxylic acids and up to 10 mol % by monofunctional or trifunctional carboxylic acids,
(b) from 20 to 70% by weight of radicals of 2-ethyl-1,3-propane diol, and
(c) from 0 to 50% by weight of radicals of other diol components, of which up to 10 mol % may be replaced by monohydric or trihydric alcohols, and
II. from 10 to 60% by weight of copolymerisable compounds.

4,112,019

STABILIZED POLYMERIZABLE POLYESTER COMPOSITIONS

Alfred Joseph Restaino, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

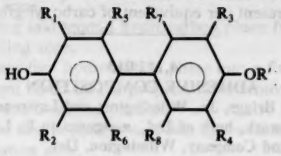
Division of Ser. No. 595,412, Jul. 14, 1975, Pat. No. 4,049,731. This application May 13, 1977, Ser. No. 796,685

Int. Cl.[2] C08K *5/04;* **C08L** *67/06*

U.S. Cl. 260—866 **4 Claims**

1. A polymerizable composition stabilized against premature polymerization comprising

(a) at least about 30 percent by weight based on the total weight of the composition of a vinyl or vinylidene monomer capable of free radical polymerization, and
(b) a polymerization inhibitor having the following general formula



wherein
R' is hydrogen or an alkyl group containing from 1 to 4 carbon atoms,
R_1, R_2, R_3 and R_4 are alkyl groups containing from 1 to 5 carbon atoms, and
R_5, R_6, R_7 and R_8 are hydrogen or alkyl groups containing from 1 to 5 carbon atoms provided that only two of these may be a secondary or a tertiary alkyl group, and
(c) an unsaturated polyester resin.

4,112,020

HOT MELT BUTYL SEALANT INTERMEDIATE

John E. Callan, Broken Arrow, Okla., assignor to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 689,023, May 24, 1976, abandoned. This application Aug. 10, 1977, Ser. No. 823,241

Int. Cl.[2] C08L *67/06*

U.S. Cl. 260—873 **12 Claims**

1. A hot melt sealant intermediate composition comprising a partially grafted mixture of (A) a butyl rubber having a Mooney viscosity (ML 1+3 at 260° F.) of about 30–80, (B) about 25–150 phr of (1) a different elastomer selected from the group consisting of diene rubbers, polyisobutylene, styrene-olefin copolymer rubbers, epichlorohydrin rubber, ethylene-propylene-polyene terpolymers, and mixtures thereof and/or (2) a crystalline polymeric resin, and (C) about 25–150 phr of an elastomeric resin, at least about 1% by weight of the mixture consisting of graft copolymers of the butyl rubber on the other components.

4,112,021

PROCESS FOR PRODUCING THERMOPLASTIC RESIN

Takesaburo Shima, Saijo; Hiroshi Kozima; Tomio Yoshida, both of Niihama, and Joji Nakamura, Nishinomiya, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Filed Dec. 15, 1976, Ser. No. 750,766

Claims priority, application Japan, Dec. 26, 1975, 51-156731

Int. Cl.[2] C08F *279/04*

U.S. Cl. 260—880 R **8 Claims**

1. A process for producing a thermoplastic resin which comprises polymerizing an aromatic monovinyl monomer and a vinyl cyanide monomer in the presence of an aqueous elastomeric latex, and then mixing with agitation the resulting copolymer latex with an aromatic monovinyl monomer, and a vinyl cyanide monomer, together with a polyalkylene oxide and a coagulant to obtain a stable suspension phase, and further polymerizing the mixture.

4,112,022

NITRILE RESINS STABILIZED AGAINST DISCOLORATION AND METHOD FOR PRODUCING THE SAME

Bruce Arthur Marien, and Paul Richard Kaufman, both of Parkersburg, W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 31, 1977, Ser. No. 783,112

Int. Cl.[2] C08K *5/20, 5/10*

U.S. Cl. 260—881 **7 Claims**

1. A nitrile resin composition stable toward thermal discoloration comprising:

A. a polymer selected from the group consisting of polymers of an α,β-unsaturated nitrile with at least one other vinyl

monomer copolymerizable therewith; graft polymers of an α, β-unsaturated nitrile, at least one additional vinyl monomer copolymerizable therewith and a diene rubber; and blends thereof, said polymer having been coagulated from a latex emulsion by use of an inorganic salt of a Group IIA metal ion, and

B. as a stabilizer, an effective amount of an acrylic acid compound selected from the group consisting of the acrylate esters of C_2 to C_6 alkylene glycols, N-(substituted alkyl) acrylamides, alkylene bisacrylamides, and mixtures thereof.

4,112,023

MOULDING COMPOSITIONS

Christopher Robert Gore, Buntingford, and Geoffrey George Arm, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jun. 20, 1975, Ser. No. 588,948

Claims priority, application United Kingdom, Jul. 11, 1974, 30724/74

Int. Cl.² C08L *33/08, 33/10*

U.S. Cl. 260—901 **10 Claims**

1. A moulding composition comprising a blend of from 90–60% by weight of a high molecular weight polymer powder of methyl methacrylate, optionally containing up to 5% by weight of a copolymerisable monomer, having a reduced viscosity of greater than 6 and having at least 80% by weight of its particles below 125 microns and at least 50% by weight above 45 microns, together with from 10–40% by weight of a copolymer powder of methyl methacrylate with more than 7% but less than 15% by weight of 2-ethyl hexyl acrylate having a reduced viscosity of between 1.5 and 9 and having less than 15% by weight of its particles greater than 125 microns.

4,112,024

PHOSPHORYL SULFENYL CHLORIDE OLEFIN ADDUCTS

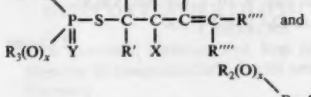
Wolfgang H. Mueller, Neuallschwil, Switzerland; Alexis A. Oswald, Mountainside, N.J., and Daniel N. Hall, Shaker Heights, Ohio, assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 594,593, Jul. 10, 1975, Pat. No. 4,003,939, which is a continuation of Ser. No. 836,128, Jun. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 595,559, Oct. 28, 1966, abandoned. This application Jan. 13, 1977, Ser. No. 759,060

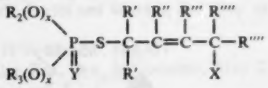
Int. Cl.² C07F *9/165*

U.S. Cl. 260—956 **11 Claims**

1. Markownikov oriented adduct materials having the formula:

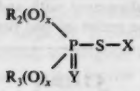


and



wherein x is 1, Y is O, R_2 and R_3 are methyl and or ethyl, X is Cl, R′, R″, R‴ and R⁗ are selected from the group of H, methyl and chlorine.

5. A method for obtaining major amounts of anti-Markownikov addition products which comprises adding a sulfenyl halide having the general formula:



wherein x is 0 or 1, R_2 and R_3 are monovalent radicals selected from the group consisting of C_1–C_{30} alkyl radicals, C_6–C_{16} aryl radicals, C_7–C_{30} alkylaryl radicals, C_7–C_{30} aralkyl radicals and the halo, alkylthio, alkoxy and acyl and carboalkoxy derivatives thereof, Y is a sulfur or oxygen atom and X is a halogen atom to an unsaturated hydrocarbon selected from the group consisting of C_3–C_{30} acrylic unsymmetrical monoolefins, C_4–C_{14} acyclic aliphatic nonconjugated multiolefins, C_3–C_{12} unsymmetrical alicyclic aliphatic monoolefins, C_5–C_{12} alicyclic aliphatic nonconjugated diolefins, C_9–C_{16} alkenyl substituted aromatic compounds, said alkenyl substituent having from 3 to 10 carbon atoms, and halogen substituted derivatives thereof, for a time sufficient to recover the addition product containing major amounts of the anti-Markownikov adduct.

4,112,025

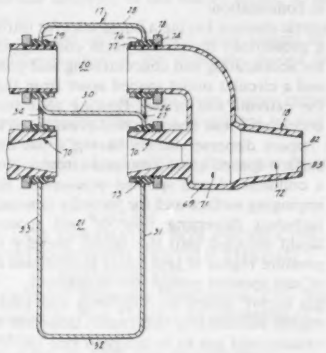
METHOD OF AND APPARATUS FOR JET AERATION

George E. Wilson, Sterling, and Milo E. Friesen, Rock Falls, both of Ill., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Continuation of Ser. No. 302,355, Oct. 30, 1972, abandoned, which is a continuation of Ser. No. 29,565, Apr. 17, 1970, abandoned. This application Jul. 26, 1973, Ser. No. 382,650

Int. Cl.² B01F *3/04*

U.S. Cl. 261—29 **4 Claims**



1. The method of treating a body of liquid by increasing the oxygen content thereof comprising the steps of

producing a pressurized liquid stream,

directing said liquid stream into a first enclosed axial flow path the cross sectional area of a portion of which decreases in the direction of the flow of the liquid stream to increase the velocity thereof,

discharging the high velocity liquid stream from said first axial flow path through an outlet formed at the downstream end thereof and substantially horizontally into an enclosed mixing chamber,

introducing a stream of pressurized air into said mixing chamber, entraining air from said air stream in said liquid stream in said mixing chamber,

directing the liquid and entrained air from said mixing chamber into a second enclosed frusto conical axial flow path of constantly decreasing cross section disposed in axial alignment with said first axial flow path, and discharging the liquid and entrained air from said second axial flow path substantially horizontally through an outlet formed at the downstream end thereof,

the outlet of said second axial flow path being located

within the body of liquid below the surface thereof and being in axial alignment with and having an open area greater than the outlet of said first axial flow path.

4,112,026

BUBBLE GENERATING APPARATUS

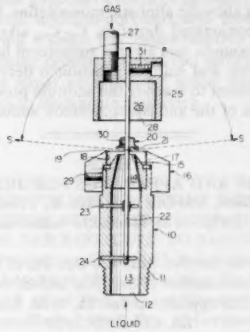
Toshiharu Kumazawa, Fujisawa, Japan, assignor to Mitsubishi Precision Co., Ltd., Japan

Filed Sep. 27, 1976, Ser. No. 727,275

Claims priority, application Japan, Nov. 4, 1975, 50-131405; May 27, 1976, 51-060559

Int. Cl.[2] C02D *1/04*

U.S. Cl. 261—29 **9 Claims**



2. An apparatus for generating bubbles in a liquid, comprising, in combination:

a nozzle element having a liquid inlet for introducing therein a pressurized liquid, a conical convergent flowing zone for accelerating and concentrating said pressurized liquid, and a circular outlet spaced apart from the liquid inlet at the extreme end of said flowing zone for spouting said accelerated and concentrated pressurized liquid;

an impact disperser means having a flat liquid impinging surface spaced apart from said circular outlet for causing a collision of said spouted pressurized liquid with said impinging surface and for forcedly generating a violently turbulent dispersing flow of said spouted pressurized liquid directed into the liquid, thereby forming a low pressure region in said liquid around said dispersing flow of said spouted pressurized liquid, and;

a gas supply means for supplying and guiding a gas to a region surrounding the impact disperser means, thereby causing said gas to be dragged into the low pressure region in said liquid and to be atomized and mixed into said dispersing flow effectively and uniformly.

4,112,027

METHOD FOR INDIRECT EVAPORATIVE COOLING OF UPFLOWING FLUID BY CONTACT WITH DOWNFLOWING WATER FROM OVERLYING EVAPORATIVE COOLING SECTION

Robert E. Cates, Leawood, Kans., assignor to The Marley Company, Mission, Kans.

Filed Jan. 30, 1976, Ser. No. 653,667

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—151 **3 Claims**

1. A method of cooling quantities of initially hot fluid comprising the steps of:

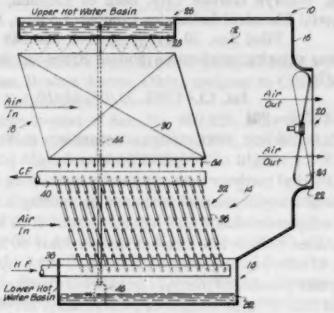
providing a fluid cooling section having a plurality of elongated, enclosed, fluid-conveying conduits which extend generally from the lower end of said section to the upper end thereof;

successively directing quantities of initially hot fluid in one direction along a first path for entry into successive lower ends of said conduits;

passing the fluid generally upwardly through said conduits;

removing the fluid from successive upper ends of said conduits and directing the same along a second path generally parallel to said first path and in a direction opposite to said one direction;

cooling the fluid during travel thereof through said conduits by causing cooling water to gravitate from the upper end of said fluid cooling section downwardly through the latter in primarily counterflow relationship to the generally upward flow of said fluid, with the cooling water impinging upon the external surfaces of said conduits for indirect sensible heat exchange between the cooling water and fluid through the walls of said conduits, whereby the coldest water entering the upper end of said fluid cooling sections comes into indirect thermal interchange relationship with the coldest portions of said fluid adjacent the upper end of said fluid cooling section;



directing ambient-derived air currents through said fluid cooling section during said gravitation of cooling water therethrough in a direction generally parallel to and the same as said one direction to cause the greatest fluid residence time to occur in the conduits adjacent the area where said ambient-derived air currents first enter the fluid cooling section and the coldest water impinges thereon; and

cooling said cooling water prior to the gravitation thereof through said fluid cooling section by allowing the water to gravitate through a water cooling section situated above said fluid cooling section which includes evaporative fill structure serving to disperse the water, and simultaneously passing currents of air through said water cooling section for evaporative cooling of the cooling water.

4,112,028

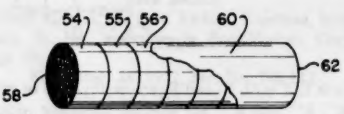
LIGHT EQUALIZER AND METHOD OF MAKING SAME

Henry H. Blau, Jr., Wayland, and Paul L. Kebabian, Somerville, both of Mass., assignors to Environmental Research & Technology, Inc., Concord, Mass.

Division of Ser. No. 458,124, Apr. 5, 1974, Pat. No. 3,887,262. This application Dec. 9, 1974, Ser. No. 530,957

Int. Cl.[2] B29D *11/00*

U.S. Cl. 264—1 **2 Claims**



1. Method of making a light equalizer comprising the steps of:

mixing at least two different powdered crystalline materials,

each capable of being compressed to form a body transparent to selected wavelengths of light and having different indices of refraction with respect to one another at said selected wavelengths;

pressing the mixed materials under pressure to form an integral body containing a plurality of centers at the interfaces between said at least two different powdered crystalline materials so as to scatter light at the said selected wavelengths; and

covering with a reflective coating the exterior surfaces of said integral body except for two opposite ends thereof.

4,112,029

MANUFACTURE OF FIBRIDS OF POLYOLEFINS

Bruno Sander, Ludwigshafen; Eckhard Bonitz, Frankenthal, and Kurt Scherling, Hemsbach, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Dec. 13, 1974, Ser. No. 532,589

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1973, 2363671

Int. Cl.[2] B01J *2/06*

U.S. Cl. 264—11 **5 Claims**

1. A process for the manufacture of discrete, non-agglomerated fibrids of an olefin polymer having at 25° C. an X-ray crystallinity of more than 5% w/w, said fibrids having a high degree of fibrillation and a high specific surface area, not agglomerating on evaporation of solvent therefrom, having substantially no shrink when left in air, and capable of being isolated in the absence of auxiliaries, which process comprises

(a) forming a solution in a pressure vessel by dissolving 0.5 to 30% w/w of said olefin polymer in a solvent which is pentane or a solvent mixture containing at least sufficient pentane to cause the polyolefin to separate in the form of discrete fibrids when said solution is relaxed, said mixture containing up to 98% pentane, under pressure at a temperature of 100° to 180° C.,

(b) passing a stream of said solution at a pressure thereof of 4 to 60 atmospheres gauge and at a temperature of 100° to 180° C. through an orifice of up to 20 mm diameter into a chamber which is at atmospheric pressure and has a temperature of 50 to 80° C., said chamber containing a body of the same liquid solvent but which is non-solvent for said olefin polymer at 50°–80° C., and said stream is passed into said body of liquid beneath the surface of said liquid,

(c) passing a liquid coaxially with said stream into said chamber to produce a field of shear forces in said chamber,

(d) flashing off in said chamber essentially all of said solvent from said stream and thereby solidifying said olefin polymer, and simultaneously forming in said field of shear forces discrete fibrids of said olefin polymer having lengths of 1 to 40 mm and thicknesses between 2 and 30 μm, and

(e) removing from said chamber a mass of said discrete, non-agglomerated fibrids.

4,112,030

METHOD AND SYSTEM FOR THE PRODUCTION OF SHEET OR PLATTER SHAPED INFORMATION CARRIERS

Martin Kremzow, Hanover, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 3, 1976, Ser. No. 682,451

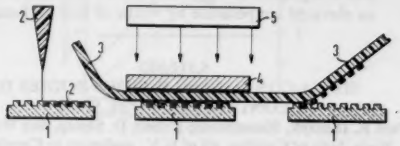
Claims priority, application Fed. Rep. of Germany, May 2, 1975, 2519476

Int. Cl.[2] B29D *17/00*

U.S. Cl. 264—25 **13 Claims**

1. A method for the production of sheet or platter shaped information carriers directly from an original carrier without use of an intermediate carrier, said information carriers having a surface structure corresponding to recorded information including video-signal memories of high storage density and the surface structure of which has the information stored in digital form as relief-like surface structure having two signal planes, comprising the steps of: providing an originally recorded rigid carrier having an original of said surface structure; providing the rigid original carrier with a layer of liquid which can be hardened under the effect of an energy radiation and which will level the surface structure; pressing together the layer side of the original carrier against an unprofiled surface of a flexible carrier material; subsequently hardening the layer liquid; and lifting the flexible carrier material off from the original carrier, together with the layer material adhering thereto forming said surface structure to create said information carriers.

11. A method for the production of duplicate high density information carrying records from a master information carrying record without use of an intermediate carrying record, comprising the steps of:



a. providing a master information carrying record having a surface structure for high density video information formed of information stored in digital form as a relief-like surface structure having two signal planes;

b. applying a layer of hardenable liquid over an information carrying surface structure of the master record to cover said structure;

c. pressing an exposed surface of said layer against an unmarked surface portion of the duplicate record to be produced;

d. hardening said layer by exposure to an energy radiation, said hardening causing the layer to adhere to said unmarked surface portion; and

e. lifting the duplicate record off from the master record.

4,112,031

PROCESS AND APPARATUS FOR PRODUCING RUBBER HOSE WITH TEXTILE THREAD REINFORCING

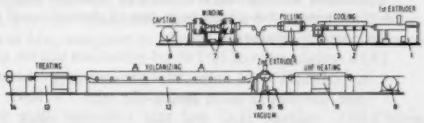
Hans-Joachim Gohlisch, Hannover-Waldhausen, Fed. Rep. of Germany, assignor to Paul Troester Maschinenfabrik, Fed. Rep. of Germany

Filed Jul. 20, 1976, Ser. No. 707,044

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1975, 2532864

Int. Cl.[2] B29D *23/05*

U.S. Cl. 264—26 **6 Claims**



1. A process of making continuous reinforced rubber hose which comprises the steps of:

extruding a tubular inner layer of rubber material at elevated temperature,

cooling the extruded tubular inner layer,

applying textile thread reinforcing around the cooled tubular inner layer,

subjecting the tubular inner layer with the textile thread thereon to a UHF field to preheat said inner layer to a

selected elevated temperature below vulcanizing temperature,

while said tubular inner layer with said thread thereon is still hot, extruding an outer layer of rubber material thereon at elevated temperature while applying a vacuum to the exterior thereof in the zone of extrusion,

whereby said tubular inner layer with said thread thereon is internally supported by air pressure inside the tubular inner layer and said outer layer is applied under said vacuum,

the temperature to which said tubular inner layer with said textile thread thereon is preheated being at least approximately as high as the temperature at which said outer layer is extruded, and

whereupon vulcanizing the hose comprising said tubular inner layer, textile thread and outer layer, said vulcanization being initiated while said tubular inner layer is still at an elevated temperature by virtue of said preheating.

4,112,032

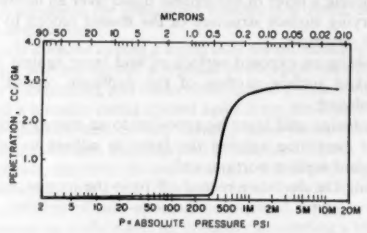
SILICA-CONTAINING POROUS BODIES OF CONTROLLED PORE SIZE

Paul E. Blaszyk, Horseheads; Robert D. Shoup, and William J. Wein, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 678,928, Apr. 21, 1976, abandoned, which is a continuation of Ser. No. 440,693, Feb. 8, 1974, abandoned. This application Dec. 12, 1977, Ser. No. 859,326

Int. Cl.[2] C04B *35/14*

U.S. Cl. 264—42 **8 Claims**



1. A method for making porous silica-containing articles exhibiting compressive strengths in the pristine state greater than about 50 psi, having pore diameters ranging between about 100Å–1 micron, wherein at least 80% of the pores therein fall within ±30% of the average pore diameter value, which consists of

(a) preparing solutions having a pH between 10–15 and containing about 1–12 moles SiO_2/liter in solution from silicate solutions selected from the group consisting of lithium polysilicate, sodium silicate, potassium silicate, quaternary ammonium silicate, and colloidal silica;

(b) combining those solutions in one of the indicated proper proportions equivalent to:

(A) a weight ratio of 19:1 to 1:4 potassium silicate solution to colloidal silica solution wherein said potassium silicate solution consists essentially of 8.3% K_2O, 20.8% SiO_2, balance H_2O and said colloidal silica solution consists essentially of 40% SiO_2, balance H_2O;

(B) a weight ratio of 1:9 to 1:3 sodium silicate solution to colloidal silica solution wherein said sodium silicate solution consists essentially of 6.8% Na_2O, 25.3% SiO_2, balance H_2O and the colloidal silica solution is that defined in (A);

(C) a weight ratio of 9:1 to 1:4 potassium silicate solution and/or sodium silicate solution to quaternary ammonium silicate solution wherein said potassium silicate solution is that defined in (A), said sodium silicate solution is that defined in (B), and said quaternary ammonium silicate solution consists essentially of 9.9% quaternary ammonium ions, 45% SiO_2, balance H_2O;

(D) a weight ratio of 19:1 to 1:4 potassium silicate solution and/or sodium silicate solution to lithium polysilicate solution wherein said potassium silicate solution is that defined in (A), said sodium silicate solution is that defined in (B), and said lithium polysilicate solution consists essentially of 2.1% Li_2O, 20% SiO_2, balance H_2O;

(c) reacting an organic compound therewith selected from the group consisting of formaldehyde, paraformaldehyde, formamide, glyoxal, methyl formate, ethyl formate, methyl acetate, ethyl acetate, and mixtures thereof at a temperature between the freezing point and the boiling point of the solution for a sufficient period of time to polymerize the silica into a coherent, porous gelled body; and

(d) leaching said gelled body with a weak acid solution to remove excess alkali metal oxide.

4,112,033

METHOD OF USING SLUDGE FOR MAKING CERAMIC ARTICLES

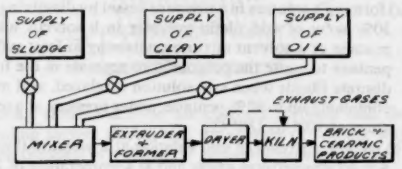
Hans Lingl, Neu-Ulm, Ludwigsfeld, Fed. Rep. of Germany, assignor to Lingl Corporation, Paris, Tenn.

Filed Jun. 10, 1974, Ser. No. 478,038

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1973, 2326267

Int. Cl.[2] C04B *33/32, 35/64*

U.S. Cl. 264—44 **7 Claims**



3. A method of producing bricks or other ceramic articles from sludge having environmentally harmful and/or toxic substances therein, comprising the steps of automatically:

(a) mixing sludge with clay in a mixer having an exhaust system,

(b) extruding the mixture so formed in an extruder having an exhaust system, and forming articles from said mixture,

(c) drying said articles so formed in a dryer having an exhaust system,

(d) venting the exhaust gases from said mixer, extruder and dryer exhaust systems to a kiln, and

(e) firing said articles in said kiln.

4,112,034

BIAXIAL FILM PROCESS AND ROTARY APPARATUS THEREFOR

James L. Nash; Stanley J. Polich, both of Glen Falls, and Philip H. Carrico, Saratoga, all of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Filed May 5, 1977, Ser. No. 794,042

Int. Cl.[2] B29D *23/04*

U.S. Cl. 264—95 **19 Claims**

1. In a bubble apparatus for producing biaxially oriented synthetic resin film comprising an extruder to extrude molten resin in stalk form, means insufflate said stalk, and means to slit the insufflated stalk, the improvement comprising:

(a) an annular die for extruding molten resin in stalk form

(b) mounting means mounting said die for rotation about its vertical axis independent of said extruder whereby resin from said extruder is extruded from said annular die in a non rotating stalk form

(c) a cylindrical cooling mandrel mounted coaxially with

said annular die for rotation therewith whereby said non rotating stalk slides axially and circumferentially over said rotating mandrel

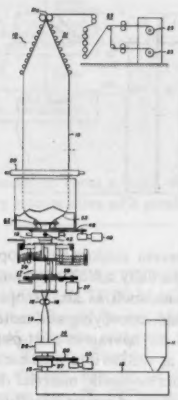
(d) drive means for rotating said die and mandrel

(e) control means to control said drive means to rotate said die and mandrel

(f) a reheat oven coaxially positioned in said apparatus with respect to said stalk to receive the said stalk from said die

(g) heating means to raise the temperature in said oven

(h) mounting means adapting said oven for rotation about the vertical axis of said die



(i) drive means rotate said oven

(j) advancing means to advance said stalk through said rotating oven and

(k) control means to control said drive means and rotate said oven.

9. In a bubble process for producing biaxially oriented synthetic resin film wherein the resin emanates from an extruder, passes over a cooling mandrel, enters a coaxial reheat oven, passes coaxially through a hot air ring, is insufflated and thereafter slit into film the improvement comprising rotating said reheat oven slowly with respect to said stalk.

4,112,035

PRODUCTION OF CALCINABLE MATERIAL

Leslie John Lawrence, Middlesbrough, and Denis Ansbro, Stockton-on Tees, both of England, assignors to Tioxide Group Limited, Billingham, England

Filed May 11, 1977, Ser. No. 796,003

Claims priority, application United Kingdom, Jun. 11, 1976, 24203/76

Int. Cl.[2] B01J *2/10*

U.S. Cl. 264—113 **8 Claims**

1. A process for the production of calcinable gypsum which comprises agitating a mixture of damp gypsum containing from 15 to 25 weight percent of water with a carbonaceous reducing agent to form pellets, and when moisture is observed at the surface of the forming pellets, adding thereto a substantially dry mixture of a powder compound of calcium and a carbonaceous reducing agent until the forming pellets are coated with the powdered mixture and are free flowing.

4,112,036

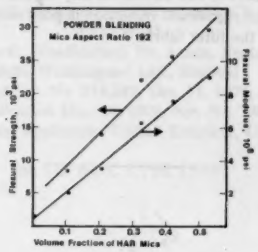
PREPARING MICA-REINFORCED COMPOSITES

Raymond T. Woodhams, Toronto, and Marinos Xanthos, Montreal, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 486,972, Jul. 10, 1974, abandoned. This application Jun. 1, 1976, Ser. No. 691,632

Int. Cl.[2] B05B *3/00*

U.S. Cl. 264—28 **11 Claims**



1. A method of preparing molding compounds for molding mica-reinforced thermosetting polyester resin composites, comprising:

a. mixing a solid curable unsaturated polyester, in the presence of a chain-extending agent for the polyester with a solid vinylic monomer, said mixing taking place in liquid form to provide an intimate blend thereof, said chainextending agent being selected to control the viscosity of the molding compounds at molding temperatures,

b. solidifying said liquid blend,

c. subdividing said solidified blend as a dry powder of selected particle size within the range of 300 to 1 microns diameter,

d. mixing the resulting dry blend particles with reinforcing mica platelets as a dry powder, at least about 50 wt. % of the blend particles having diameters less than about one fifth of the average diameter of the mica platelets, said mixing being sufficient to effect intimate dispersion and to coat the mica platelets with the blend particles,

e. heating the blend particle-coated mica platelets to soften and partially coalesce the blend particles and to densify the mixture, without initiating cross-linking of said polyester,

f. shaping said partially-coalesced blendcoated mica platelets into a desired form, and

g. cooling said shaped coated platelets to form said molding compounds wherein said mica platelets are uniformly distributed with substantial retention of initial mica platelet aspect ratio.

4,112,037

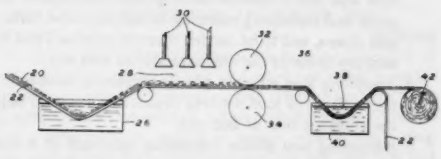
PROCESS OF MAKING AIR FILTER FABRIC

Roy B. Parker, Monmouth, and Richard R. Saindon, Hebron, both of Me., assignors to Albany International Corp., Albany, N.Y.

Filed Jan. 31, 1977, Ser. No. 763,898

Int. Cl.[2] D04H *1/46, 1/54*

U.S. Cl. 264—126 **3 Claims**



1. A process for making an air filter fabric which comprises;

providing a non-woven web of thermoplastic, fusable, synthetic polymeric resin, staple fibers;

coating the fibers with a film of a compatible fiber stabilizing agent;

pressing the coated fibers together so as to rupture said film at fiber cross-over points; and

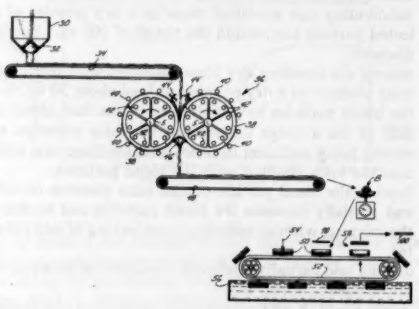
fusing the fibers together at said cross-over points while the coating remains intact at unruptured points, whereby the fundamental shape, geometry or configuration of the staple fibers is not altered to any significant degree and there is no significant reduction in pore size or air permeability of the filter fabric.

4,112,038

METHOD FOR PRODUCING MOLDED ARTICLES

Lynn Thomas Garner, Wilmington, N.C., assignor to Lowe Paper Company, Ridgefield, N.J. and Bolivia Lumber Company, Wilmington, N.C.

Filed Sep. 2, 1976, Ser. No. 719,756
Int. Cl.[2] B29C *3/02*
U.S. Cl. 264—138 **1 Claim**



1. Method of producing a molded article of desired shape from a by-product of a process producing a paper product having a thermoplastic material coating said by-product comprising a thermoplastic material impregnated with a fibrous material, comprising:

a. separating a portion of the fibrous material from said by-product;

b. returning said portion of separated fibrous material to said paper product process;

c. delivering the remaining portion of said thermoplastic material and fibrous material to the exit side of a nip defined between a pair of contra-rotating heated drums to heat and render said remaining materials plastic, and to cause said remaining materials to adhere to the surfaces of said drums, and to be carried thereon from said exit side of said nip towards the entrance side of said nip;

d. removing said adhered plastic remaining materials from the surfaces of said rotating drums at a location adjacent the entrance side of said nip;

e. delivering said plastic remaining materials to a molding means; and

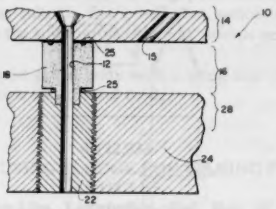
f. molding said plastic materials to a desired article shape.

4,112,039

PELLETIZING PROCESS

David W. Cuff, Chepachet, R.I., assignor to Leesona Corporation, Warwick, R.I.

Continuation-in-part of Ser. No. 549,375, Feb. 12, 1975, Pat. No. 3,981,959, which is a continuation-in-part of Ser. No. 414,699, Feb. 10, 1974, abandoned, which is a division of Ser. No. 287,276, Sep. 8, 1972, Pat. No. 3,792,950. This application Sep. 27, 1976, Ser. No. 727,155
Int. Cl.[2] B28B *11/16*
U.S. Cl. 264—142 **8 Claims**



1. A method wherein molten thermoplastic material is formed into at least partially solidified strands as it is extruded into a gaseous medium such as air, comprising heating said material to make it fluid, conveying said material into the initial zone of an extrusion die having at least one extrusion orifice including said initial, as well as intermediate and final extrusion zones, forcing said thermoplastic material through said orifice and outward from said die in rod or strand-like forming having at least a solidified outer wall structure surrounding an inner core of said thermoplastic material, directing a liquid coolant under pressure into said intermediate zone of said extrusion orifice downstream from said initial zone to contact the outer surface of said thermoplastic material passing therethrough while at least partially vaporizing said coolant to simultaneously form said solidified outer wall structure and to provide a lubricating film between the inner eall of said orifice and said thermoplastic material to facilitate passage of said material therethrough, providing a heat reservoir in that portion of said die surrounding said final zone downstream of said intermediate zone at a significantly higher temperature than the softening temperature range of said thermoplastic material being extruded therethrough, maintaining the flow of said coolant between said solidified outer wall and the inner wall of said orifice in said final zone so as to thermally insulate said thermoplastic material from said heat reservoir while said thermoplastic material is being extruded through said orifice and interrupting the flow of said coolant in said final zone upon thermoplastic material freeze-off in said final zone of said orifice so that heat from said reservoir then passes from said reservoir to said final zone of said orifice so as to melt the thermoplastic material forming said freeze-off therein.

4,112,040

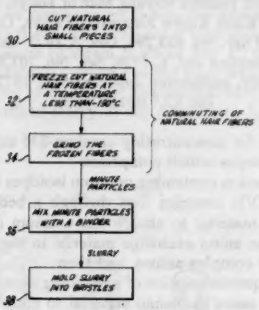
METHOD OF MAKING FIBERS CONTAINING HAIR PARTICLES

Norman Orentreich, 140 E. 72nd St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 720,831, Sep. 7, 1976, abandoned. This application Apr. 21, 1977, Ser. No. 789,577
Int. Cl.[2] B29F *3/00*; B29B *1/00, 1/12*
U.S. Cl. 264—176 F **11 Claims**

1. A method for fabricating natural-like hair bristles for use in a hair brush or the like, said process comprising the steps of comminuting a quantity of natural hair fibers into a plurality of minute particles said comminuting including the steps of freez-

ing said hair fibers to a temperature less than −190° C, and thereafter grinding said frozen hair fibers, mixing said minute



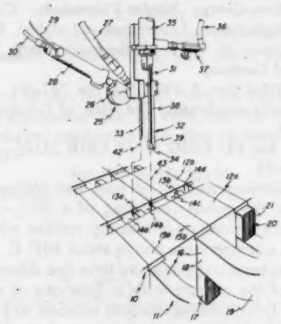
particles with a binder to form a thick slurry, and thereafter molding said slurry into bristles of a predetermined size.

4,112,041

METHOD FOR REDUCING CORONA IN DYNAMOELECTRIC MACHINES

Palmer Lonseth; Hubert Gerald Panter, and Donald G. Moorby, all of Peterborough, Canada, assignors to Canadian General Electric Company, Toronto, Canada

Division of Ser. No. 656,865, Feb. 10, 1976, Pat. No. 4,068,691.
This application Apr. 28, 1977, Ser. No. 791,663
Claims priority, application Canada, Feb. 17, 1975, 220400
Int. Cl.[2] B29D *3/00;* **H02K** *15/02*
U.S. Cl. 264—263 **3 Claims**



1. The method of inhibiting corona in a dynamoelectric machine including a core having a plurality of stacks of magnetic laminations spaced apart axially to define interstack spaces; axially directed slots in said core; spacers disposed radially in said interstack spaces; and coil sides disposed in said slots; said method comprising:

(a) positioning an injector tool in an interstack space and adjacent to a radial surface of a coil side, said injector tool including a flat face of width slightly less than the width of said interstack space and said face having an orifice in the middle thereof for accommodating flow of an uncured, semiconducting, elastomeric material from a source connected to said injector tool;

(b) securing the tool in said interstack space with the flat face pressed against said radial surface of said coil side;

(c) releasing said uncured material from said source for flow through said orifice, along said face, and between the radial surface of said coil side and the slot walls adjacent to said tool;

(d) releasing said tool;

(e) repeating steps (a), (b), (c), and (d) for other coil sides in this and other interstack spaces; and

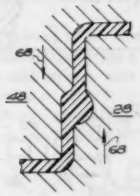
(f) curing said material to form a tough, rubbery compound having an electrical resistance low enough to conduct electric charge and yet high enough to not cause significant eddy-current flow between core laminations.

4,112,042

MOULDING OF SYNTHETIC PLASTICS SHEET MATERIAL

Jack Brocklehurst, Woodlesford, Nr. Leeds, England, assignor to Plastona (John Waddington) Ltd., England

Continuation of Ser. No. 514,093, Oct. 11, 1974, abandoned.
This application Dec. 10, 1976, Ser. No. 749,280
Claims priority, application United Kingdom, Oct. 12, 1973, 47848/73
Int. Cl.[2] B29C *17/00, 17/04*
U.S. Cl. 264—322 **2 Claims**



1. A method employing male and female dies for molding thermoformable synthetic plastics sheet material into a circular lid having a downturned rim with a bead on its inner face whereby the lid can fit over the top edge of a container with the bead in sealing engagement with the container, the male die having an outer annular wall providing a cavity for forming a bead on the inner face of the downturned rim of the lid and the female die having an inner annular wall for forming the outer surface of the downturned rim, the method comprising the steps of

a. softening the sheet material by the application to it of heat whereby the material is in a moldable state,

b. disposing the softened sheet material between the dies,

c. moving the dies together to cause the softened sheet material to be folded over the male die until the spacing between the inner and outer annular walls is less than the starting thickness of the sheet material whereby the sheet material between the outer and inner annular walls is caused to form the down-turned rim and is subjected to simultaneous compressive and shear forces which cause some of the material of the downturned rim to be forced into the bead cavity of the male die and form the bead on the inner face of the downturned rim of the lid.

4,112,043

ELECTRICAL CONDUCTOR FOR A BUSHING AND METHOD OF MAKING AN ELECTRICAL BUSHING

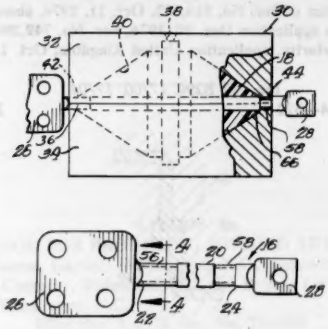
Charles F. Williams, Edinboro, Pa., assignor to Teledyne Penn-Union, Edinboro, Pa.

Filed Oct. 21, 1976, Ser. No. 734,451
Int. Cl.[2] H01B *19/00, 5/02, 17/26;* **B22D** *19/00*
U.S. Cl. 264—250 **3 Claims**

2. An electrical conductor element for bushing assembly of the type described comprising an elongated cast metal conductor member including a portion around which a body of insulating material is to be molded, a free end portion for connection to complementary electrical means, and a connecting portion joining said first-mentioned portion and said free end portion and a preformed annular metal insert surrounding and secured to said joining portion and having an accurately di-

mensioned exterior surface cooperable with a mold during molding of a body of insulating material around said first-mentioned portion for providing a mold shutoff.

3. A method of producing an electrical bushing assembly having an electrical conductor element with a body of insulating material molded around one portion of the element and another portion of the element projecting outwardly of said body, said method comprising providing a preformed tubular metal insert having a relatively accurately dimensioned peripheral surface, placing said insert in a mold having a cavity for forming said conductor element, introducing molten metal into



said mold cavity for filling the cavity and said tubular insert and thereby forming the cast electrical conductor with said insert fixed with respect thereto, thereafter placing said electrical conductor in a second mold having a cavity for forming the body of insulating material and a passageway from the cavity for accommodating the portion of the electrical conductor which projects from the insulating material body, said accurately dimensioned insert surface tightly engaging surface means of said second mold for sealing said passageway and thereby providing a mold shutoff, and thereafter pressure feeding insulating material to fill said second mold cavity.

4,112,044

CHROMATOGRAPHIC SEPARATION OF URANIUM ISOTOPES

Tetsuya Miyake; Maomi Seko, both of Tokyo; Kohji Inada, Yokohama; Kazushi Ochi, Yokohama, and Tomio Sakamoto, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1976, Ser. No. 687,840

Claims priority, application Japan, Sep. 6, 1975, 50-108348

Int. Cl.[2] C01G *56/00*

U.S. Cl. 423—7 **21 Claims**

1. In a process for separating uranium isotopes by forming a uranium adsorption zone on an anion exchange material in contact with the front boundary between an oxidizing agent zone and said uranium adsorption zone or the rear boundary between a reducing agent zone and said uranium adsorption zone or both boundaries, the said boundaries being moved by a continuous feed of an uranium solution or a reducing agent solution as an eluant solution thereby concentrating uranium-238 in the vicinity of the front boundary, uranium-235 in the vicinity of the rear boundary or both thereof, the improvement which comprises adding one or more electron exchange catalysts in at least one of the uranium and the reducing agent solutions to raise the electron exchange reaction rate constant k in the uranium adsorption zone to at least 1 liter/mol min while the selectivity coefficient $K_{U(V)}^{U(VI)}$ is 2 or more.

4,112,045

SEPARATION OF URANIUM ISOTOPES USING ANION EXCHANGERS

Maomi Seko, and Tetsuya Miyaki, both of Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 403,294, Oct. 3, 1973, abandoned. This application Jul. 1, 1976, Ser. No. 701,912

Claims priority, application Japan, Oct. 5, 1972, 47-99407

Int. Cl.[2] B01D *59/30*

U.S. Cl. 423—7 **30 Claims**

1. A process for concentrating uranium-235 using a solution of uranium isotopes which comprises:

passing a solution containing uranium isotopes in the form of uranium (VI) complex ions through a bed of an anion exchange material to absorb the uranium (VI) complex ions on the anion exchange material in the form of uranium (VI) complex anions, and then

passing on aqueous solution of a reducing agent through said bed of an anion exchange material to elute said uranium (VI) complex anions adsorbed on said anion exchange material while simultaneously reducing said uranium (VI) complex anions to uranium (IV) complex ions thereby forming, in the downstream direction, a distinct boundary between a zone of reducing agent where the uranium (VI) complex anions have been eluted and a zone of adsorbed uranium (VI) complex anions,

thereby concentrating uranium-235 isotope in the portion of adsorbed uranium (VI) complex anions adjacent to said boundary which moves through the anion exchange material while feeding the solution of the reducing agent to the anion-exchange material.

4,112,046

DISINTEGRATION OF SILICA-RICH CHROMITE

Hans Niederprüm, Monheim; Johann-Nikolaus Meussdoerffer, Blecher; Hans-George Nieder-Vahrenholz, Cologne, and Wolfgang Bockelmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 3, 1976, Ser. No. 747,261

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557403

Int. Cl.[2] C01G *37/14;* **C01B** *33/26*

U.S. Cl. 423—53 **7 Claims**

1. In the disintegration of at least one chromium source selected from the group consisting of a SiO_2— containing chromite and a chromium-containing residue with an alkali compound at a temperature above about 800° C. in the presence of atmospheric oxygen and a lime-free diluent, followed by leaching of the mixture with at least one of water and a chromium (VI)- containing aqueous solution to form a chromate liquor, the improvement which comprises including in the mixture to be disintegrated an aluminum compound and at least sufficient alkali to form alkali chromate and to convert the SiO_2 into an insoluble alkali-aluminum silicate corresponding to the formula $nMe_2O \cdot mSiO_2 \cdot Al_2O_3$, wherein Me is at least one of sodium and potassium, $0.8 \leqq n \leqq 1.2$ and $1.3 \leqq m \leqq 4.3$, whereby disintegration is effected with minimal formation of liquid or doughy phases and the chromium is thereafter leached from the mixture in high yield without significant quantities of alumina entering the chromate liquor.

4,112,047

PRETREATMENT SYSTEM FOR GOETHITIC BAUXITES

Donald J. Donaldson, Orinda, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

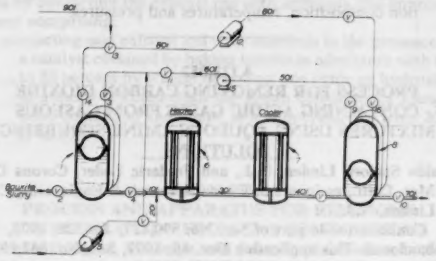
Filed Jun. 8, 1977, Ser. No. 804,841

Int. Cl.[2] C01F *7/06*

U.S. Cl. 423—123 **7 Claims**

1. A stage-wise pretreatment process for goethite-containing bauxite slurries for the conversion of the goethite-content to hematite and/or magnetite at temperatures in excess of about

260° C and at elevated pressures prior to the conventional Bayer process digestion of the bauxite for the extraction of its alumina content which comprises introducing a thick slurry into a bauxite slurry charging stage consisting of at least one float-type liquid displacement pump, the pump being capable of imparting to the slurry a pressure at least about equivalent to the vapor pressure of steam at about 260° C; transferring the pressurized slurry to a slurry heating stage which is connected to the pump for receiving the pressurized slurry and for heating the pressurized slurry to the goethite to hematite and/or



magnetite conversion temperature; pumping the heated and pressurized slurry to a cooling stage to reduce the temperature of the slurry without flashing off steam to about the temperature conventionally utilized for the digestion of bauxites; introducing the cooled and pressurized slurry to a slurry discharge stage which is connected to the cooling stage, the slurry discharge stage consisting of at least one float-type, liquid displacement pump from which the cooled slurry is charged without flashing off steam into the conventional Bayer process digestion vessels by displacing it with a liquid.

4,112,048

AIR-REGENERATION FILTER

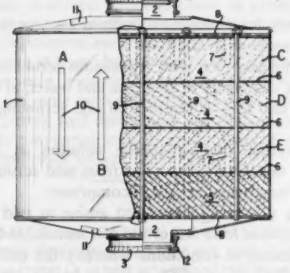
Werner Mascher, Bismarckstr. 6, 1000 Berlin 41, Fed. Rep. of Germany

Continuation of Ser. No. 523,805, Nov. 14, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,503

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1973, 2357512

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—210 **8 Claims**



1. A reversible air-regeneration filter for producing a relatively constant quantity of oxygen by selectively varying the moisture content of air, which includes carbon dioxide, passed therethrough, said filter comprising:

a container;

alkali peroxide for reacting with moisture and carbon dioxide present in said air to produce oxygen;

alumina gel for removing moisture from said air;

said container having first and second openings, said alkali peroxide being positioned within said container adjacent to said first opening and said alumina gel being positioned within said container adjacent to said second opening,

means for controlling the direction of flow of said air through said filter such that said air selectively communicates directly with said alkali peroxide or such that said air first communicates with said alumina gel before communicating with said alkali peroxide,

whereby said reversible filter produces a relatively constant amount of oxygen which is uneffected by variations in the moisture content of said air to be regenerated.

4,112,049

ABSORPTION OF SULFUR COMPOUNDS FROM GAS STREAMS

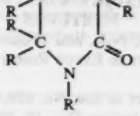
John W. Bozzelli; George D. Shier, both of Midland, Mich.; Roscoe L. Pearce, and Charles W. Martin, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1977, Ser. No. 778,904

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—226 **6 Claims**

1. A process for removing sulfur compounds of the group H_2S and lower alkyl mercaptans from a gaseous stream which comprises contacting said stream with a liquid piperazinone compound of the formula



wherein each R, R′, and R″ is independently a hydrogen atom or a lower alkyl group, thereby forming a mixture of said piperazinone rich in H_2S and alkyl mercaptans.

4,112,050

PROCESS FOR REMOVING CARBON DIOXIDE CONTAINING ACIDIC GASES FROM GASEOUS MIXTURES USING A BASIC SALT ACTIVATED WITH A HINDERED AMINE

Guido Sartori, Linden, N.J., and Frederic Leder, Corona Del Mar, Calif., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 590,427, Jun. 26, 1975, abandoned. This application Dec. 19, 1977, Ser. No. 862,196

Int. Cl.[2] B01D *53/34*

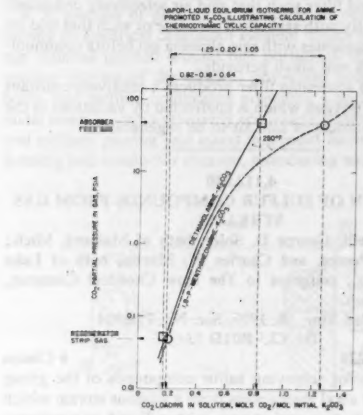
U.S. Cl. 423—223 **38 Claims**

1. In a process for removing CO_2 from gaseous feeds containing CO_2, which comprises:

(1) contacting said gaseous feeds with an aqueous scrubbing solution comprising: (a) an alkaline material comprising a basic alkali metal salt or alkali metal hydroxide, (b) an activator for said basic alkali metal salt or alkali metal hydroxide comprising at least one amine activator for said alkaline material, and (c) water, and

(2) regenerating said aqueous scrubbing solution at conditions whereby CO_2 is desorbed from said aqueous scrubbing solution, the improvement which comprises providing at least one sterically hindered amine as at least one of the amine activators, and operating said process at conditions whereby the difference between the moles of carbon dioxide absorbed at the end of step (1) (absorption step) and the moles of carbon dioxide absorbed at the end of step (2) (desorption step) would be greater at the thermodynamic equilibrium (as determined from the vapor-liquid equilibrium isotherm of the reaction mixture) than in an

aqueous scrubbing process wherein diethanolamine is the only amine activator utilized under similar conditions of


VAPOR-LIQUID EQUILIBRIUM ISOTHERMS FOR AMINE-PROMOTED K_2CO_3 ILLUSTRATING CALCULATION OF THERMODYNAMIC CYCLIC CAPACITY
1.25 - 0.20 = 1.05
0.82 - 0.18 = 0.64
ABSORBER FEED GAS
250°F
REGENERATOR STRIP GAS
CO_2 PARTIAL PRESSURE IN GAS, PSIA
CO_2 LOADING IN SOLUTION, MOLS CO_2/MOL INITIAL K_2CO_3

gaseous feed composition, scrubbing solution composition, temperatures and pressures.

4,112,051

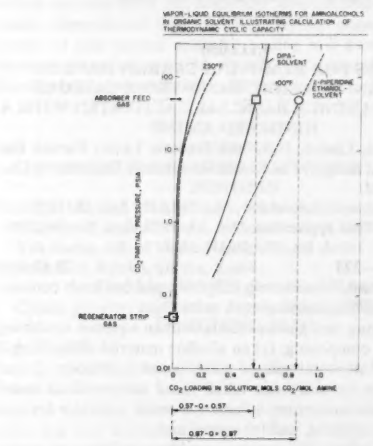
PROCESS AND AMINE-SOLVENT ABSORBENT FOR REMOVING ACIDIC GASES FROM GASEOUS MIXTURES

Guido Sartori, Linden, N.J., and Frederic Leder, Corona Del Mar, Calif., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 590,427, Jun. 26, 1975, abandoned. This application Dec. 19, 1977, Ser. No. 862,195

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—223 **34 Claims**


VAPOR-LIQUID EQUILIBRIUM ISOTHERMS FOR AMINOALCOHOLS IN ORGANIC SOLVENT ILLUSTRATING CALCULATION OF THERMODYNAMIC CYCLIC CAPACITY
DIPA-SOLVENT
250°F
100°F
2-(PIPERIDINE ETHANOL-SOLVENT
ABSORBER FEED GAS
REGENERATOR STRIP GAS
CO_2 PARTIAL PRESSURE, PSIA
CO_2 LOADING IN SOLUTION, MOLS CO_2/MOL AMINE
0.57 - 0 = 0.57
0.87 - 0 = 0.87

1. In a process for the removal of CO_2 from a normally gaseous feed containing CO_2 which comprises.

(1) contacting said normally gaseous feed with an amine-solvent liquid absorbent comprising:

(a) an amine, and

(b) a solvent which solubilizes said amine and is a physical absorbent for said CO_2, and

(2) regenerating said absorbent at conditions whereby CO_2 is desorbed from said absorbent, the improvement which comprises providing at least one sterically-hindered amine in said scrubbing solution as said amine and operating said process at conditions whereby the difference between the moles of CO_2 absorbed at the end of step (1) (absorption step) and the moles of CO_2 absorbed at the end of step (2) (desorption step) would be greater at the thermodynamic equilibrium of the vapor-liquid system (as determined from the vapor-liquid equilibrium isotherm of the reaction mixture) than in a CO_2 gas scrubbing process utilizing a nonaqueous organic solvent and an amine wherein diisopropanolamine is the only amine utilized under similar conditions of gaseous feed composition, scrubbing solution composition, temperatures and pressures.

4,112,052

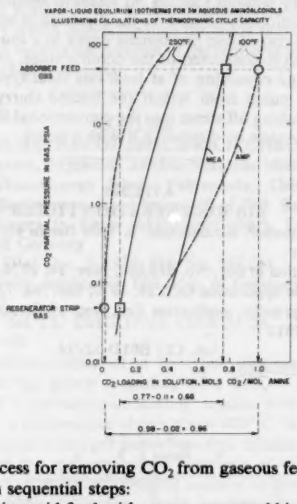
PROCESS FOR REMOVING CARBON DIOXIDE CONTAINING ACIDIC GASES FROM GASEOUS MIXTURES USING AQUEOUS AMINE SCRUBBING SOLUTIONS

Guido Sartori, Linden, N.J., and Frederic Leder, Corona Del Mar, Calif., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 590,427, Jun. 26, 1975, abandoned. This application Dec. 19, 1977, Ser. No. 862,197

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—228 **19 Claims**


VAPOR-LIQUID EQUILIBRIUM ISOTHERMS FOR 3M AQUEOUS AMINOALCOHOLS ILLUSTRATING CALCULATIONS OF THERMODYNAMIC CYCLIC CAPACITY
250°F
100°F
ABSORBER FEED GAS
MEA
AMP
REGENERATOR STRIP GAS
CO_2 PARTIAL PRESSURE IN GAS, PSIA
CO_2 LOADING IN SOLUTION, MOLS CO_2/MOL AMINE
0.77 - 0 = 0.68
0.98 - 0.02 = 0.96

1. In a process for removing CO_2 from gaseous feeds which comprises, in sequential steps:

(1) contacting said feed with an aqueous scrubbing solution consisting essentially of an amine and water, at conditions whereby said CO_2 is absorbed in said scrubbing solution, and

(2) regenerating said scrubbing solution at conditions whereby said CO_2 is desorbed from said scrubbing solution, the improvement which comprises:

providing a sterically hindered amine in said scrubbing solution as at least one of the said amines, and operating said process at conditions whereby the difference between the moles of CO_2 absorbed at the end of step (1) (absorption step) and the moles of CO_2 absorbed at the end of step (2) (desorption step) would be greater at thermodynamic equilibrium of the vapor-liquid system (as determined from the vapor-liquid equilibrium isotherm of the reaction mixture) than in an aqueous amine CO_2 scrubbing process wherein monoethanolamine or diethanolamine is the only amine utilized under similar conditions of gaseous feed composition, scrubbing composition, temperatures and pressures.

4,112,053

DRY METHOD FOR THE DENITRIFICATION OF EXHAUST GAS CONTAINING NITROGEN OXIDES

Hisao Sanada; Ritaro Saito; Masayuki Funabashi, all of Iwaki; Kazuyoshi Inada, and Koji Seguchi, both of Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1977, Ser. No. 756,628
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—239 **3 Claims**

1. In a method for removing nitrogen oxides from an exhaust gas by contacting the exhaust gas with ammonia, the improvement comprising:

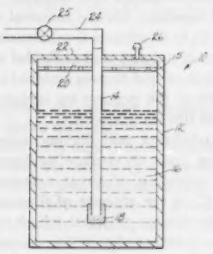
contacting said exhaust gas with ammonia in the presence of a catalyst obtained by baking laterite in admixture with 0.1 to 20 percent by weight of at least one oxide or hydroxide of a metal selected from the group consisting of manganese, cobalt and aluminum, at a temperature of from 200° C to 500° C.

4,112,054

PROCESS AND APPARATUS FOR REMOVING ETHYLENE OXIDE FROM GAS COMPOSITIONS

Michael Feingold, Randolph, and John Sparks, Boston, both of Mass., assignors to New England Industrial Chemical Co., Mass.

Filed May 25, 1977, Ser. No. 800,160
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—245 **8 Claims**



1. The process for removing at least about 97% of the ethylene oxide from a predetermined volume of a gas composition containing ethylene oxide which comprises passing said predetermined volume of said gas composition through an aqueous acidic solution to dissolve said ethylene oxide in solution and to convert said dissolved ethylene oxide to products including ethylene glycol, said solution having a pH less than about 4 and an initial temperature less than about 50° C, the volume of said solution being at least about 440 ml/mole ethylene oxide, said pH, temperature, volume of solution per mole of ethylene oxide and the mole ratio of acid to ethylene oxide being controlled to permit said dissolution and conversion of ethylene oxide while preventing evolution of dissolved ethylene oxide from solution prior to said conversion.

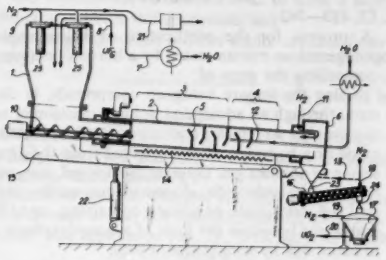
4,112,055

METHOD OF FABRICATION OF URANIUM OXIDE UO_2 BY THE DRY PROCESSING ROUTE AND A DEVICE FOR THE PRACTICAL APPLICATION OF THE METHOD

Robert Artaud, Aix-en-Provence, France, assignor to Commissariat a l'Energie Atomique, France

Filed May 3, 1976, Ser. No. 682,747
Claims priority, application France, May 9, 1975, 75 14490
Int. Cl.[2] C01G *43/02, 43/06*
U.S. Cl. 423—261 **6 Claims**

1. A method of fabrication of uranium oxide UO_2 by the dry processing route which consists of a first step in which uranium hexafluoride gas is reacted with steam within a first region of a vessel and of a second step in which the oxyfluoride UO_2F_2 obtained during the first step is subjected to a reduction within a second region of said vessel so as to obtain the uranium oxide UO_2, wherein the second step consists of a first stage in which the oxyfluoride UO_2F_2 obtained during the first step is contacted with a mixture of hydrogen gas and steam in a first zone of the second region of said vessel and of a second stage in which the oxide having an intermediate composition between U_3O_8 and UO_2 thus obtained is contacted with hydrogen gas in the absence of steam within a second zone of the



second region of said vessel, the temperature of said second zone being higher than the temperature of said first zone and wherein hydrogen is introduced into said second zone and the reaction gases which pass out of the second zone in order to penetrate into the first zone of the second region of said vessel follow a non-rectilinear path, steam is introduced into said first zone and the hydrogen and steam flow countercurrent to the oxyfluoride and the intermediate composition in the first and second zones.

4,112,056

PREPARATION OF ZEOLITES

Nai Yuen Chen, Titusville; Joseph Nicolas Miale, Lawrenceville, both of N.J., and William Joseph Reagan, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1977, Ser. No. 792,741
Int. Cl.[2] C01B *33/28;* C07F *5/06*
U.S. Cl. 423—329 **15 Claims**

1. A method for preparing crystalline aluminosilicate zeolites having a silica/alumina mole ratio of greater than 10 from an amorphous mixture of reaction components which comprises

forming an amorphous mixture containing sources of an alkali metal oxide, an organic nitrogen-containing oxide, an oxide of silicon and water and having a composition in terms of mole ratios of oxides, as follows:

OH^-/SiO_2	=	0.01 - 0.5
Al_2O_3/SiO_2	=	0 - 0.01
H_2O/OH^-	=	50 - 500
M_2O/SiO_2	=	0.01 - 1.0
R_2O/SiO_2	=	0.01 - 0.5

wherein R is an organic nitrogen-containing cation and M is an alkali metal ion, and while maintaining the mixture at a temperature of from about 180° F to about 400° F until crystals of the aluminosilicate zeolite are formed,

adding to said mixture a source of aluminum ions at a rate of addition whereby the concentration of aluminum ions in the amorphous mixture is maintained at steady state during crystallization of aluminosilicate zeolite therefrom, thereby maintaining any excess of aluminum ions in said mixture at a minimum by replenishing same at about the same rate as the rate of their consumption during crystallization.

4,112,057

PROCESS FOR PURIFYING HALOGENOSILANES

Winfried Lang; Dietrich Schmidt, both of Burghausen; Johann Hofer, Kirchdorf; Rudolf Pachnek, Raitenhaslach, and Heinz-Jorg Rath, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Oct. 14, 1976, Ser. No. 732,269

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1975, 2546957

Int. Cl.[2] C01B *33/08*

U.S. Cl. 423—342 4 Claims

1. A process for the purification of halogenosilanes or halogenogermanes contaminated by a boron-containing impurity, comprising the steps of:

(a) passing the impure halogeno compounds, in the liquid state, through an adsorption column containing an effective amount to remove said impurity of a hydrated metal oxide or a hydrated silicate selected from the group consisting of alumina gel, titanium dioxide gel, iron oxide gel, magnesium hydroxide, diatomaceous earths and silicic acid gel, said oxide or silicate containing, in addition to that water bound in the form of a complex, from about 3 to about 8% by weight free water;

(b) distilling the treated halogeno compound exiting said adsorption column, at atmospheric pressure and at a temperature about 3° to about 15° C. above the boiling temperature thereof; and

(c) recovering the purified halogeno compound.

4,112,058

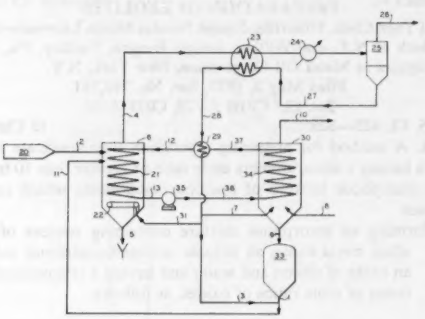
PRODUCTION OF CARBON MONOXIDE FROM CARBONACEOUS MATERIAL AND ZINC OXIDE

Donald O. Hanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 23, 1976, Ser. No. 716,402

Int. Cl.[2] C01B *31/18*

U.S. Cl. 423—415 A 8 Claims



1. A process for the production of carbon monoxide which comprises

a. introducing a solid carbon source and zinc oxide into a reactor equipped with first indirect heat exchange means,

b. reacting said solid carbon source and said zinc oxide at a temperature of 1665° to 2800° F in said reactor to form a gas comprising carbon monoxide and zinc,

c. withdrawing said gas from said reactor,

d. separating zinc from said gas and recovering a carbon monoxide-comprising gas,

e. contacting said zinc with an oxidizing agent to form a zinc oxidation mixture in a zinc oxidizer equipped with second indirect heat exchange means,

f. reacting said zinc oxidation mixture to form zinc oxide, and

g. circulating a heat exchange fluid selected from the group consisting of zinc, sodium, potassium and mixtures of sodium and potassium indirect heat exchange with the contacting of material in the zinc oxidizer to indirect heat exchange with the reacting of materials in said reactor to transfer a portion of the reaction heat developed in said zinc oxidizer into said reactor.

4,112,059

PROCESS FOR THE PRODUCTION OF CARBON FILAMENTS UTILIZING AN ACRYLIC PRECURSOR

Andrew H. DiEdwardo, Parsippany, and Robert Dix, Wayne, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,764

Int. Cl.[2] D01F *9/12, 9/22*

U.S. Cl. 423—447.6 10 Claims

1. An improved process for the production of a multifilament carbonaceous fibrous material which is suitable for use as a fibrous reinforcement in a resinous matrix consisting essentially of:

(a) contacting a multifilament acrylic fibrous material selected from the group consisting of an acrylonitrile homopolymer and acrylonitrile copolymers containing at least about 85 mol percent acrylonitrile units and up to about 15 mol percent of one or more monovinyl units copolymerized therewith with a liquid medium comprising a dispersion of colloidal silica having a number average particle size of about 5 to 50 millimicrons in a C_1 to C_3 alkanol in a concentration of about 0.002 to 1.0 percent by weight based upon the weight of said alkanol,

(b) drying said resulting fibrous material under conditions wherein said C_1 to C_3 alkanol is substantially evolved from said fibrous material and said colloidal silica is deposited upon the surface of said fibrous material in a concentration of about 0.005 to 0.4 percent by weight based upon the weight of said fibrous material,

(c) thermally stabilizing said fibrous material bearing said colloidal silica upon its surface by heating in a gaseous atmosphere consisting of air at a temperature of about 230° to 300° C. in the absence of filament coalescence to form a flexible fibrous material which retains its original configuration substantially intact, is non-burning when subjected to an ordinary match flame, and is capable of undergoing carbonization,

(d) substantially removing said colloidal silica from said fibrous material, and

(e) heating said resulting thermally stabilized fibrous material in a non-oxidizing gaseous atmosphere selected from the group consisting of nitrogen, argon, and helium at a temperature of at least 1000° C. until a carbonized fibrous material containing at least 90 percent carbon by weight is formed.

4,112,060

METHOD FOR THE PRODUCTION OF CARBON BLACK FROM LIQUID OR GASEOUS HYDROCARBONS

Arthur E. Fross, Basel, Switzerland, assignor to Etablissement Gelan, Vaduz, Liechtenstein

Continuation of Ser. No. 412,599, Nov. 5, 1973, abandoned. This application May 14, 1976, Ser. No. 686,324

Claims priority, application Switzerland, Nov. 10, 1972, 16415/72; Aug. 31, 1973, 12537/73

Int. Cl.[2] C01B *31/02;* C09C *1/48*

U.S. Cl. 423—450 18 Claims

1. Method for production of carbon black from lqiuid hydrocarbon material in the presence of a free-oxygen-containing air-like gas by thermal decomposition of the hydrocarbon material through partial combustion thereof in a hot reaction chamber having an entry end and an exit end at opposite ends of a straight axis through the chamber, the hot condition of which chamber is maintained mainly by said partial combustion, comprising the steps of:

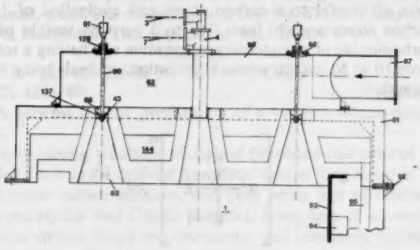
pressurizing said liquid hydrocarbon material and preheating it;

preheating said free-oxygen-containing gas;

distributing and injecting said pressurized and preheated liquid hydrocarbon material in a finely divided state into, and passing it in an axial direction through, a plurality of ante-chambers open to said reaction chamber at the entry end of the latter and having their axes substantially parallel to said axis of said reaction chamber, and vaporizing said hydrocarbon material during its passage through said ante-chambers, said ante-chambers being substantially evenly distributed over said entry end of said reaction chamber;

distributing said preheated free-oxygen-containing gas to all said ante-chambers and passing said gas axially through said ante-chambers while mixing said gas with said hydrocarbon material therein to form a reagent mixture in said ante-chambers;

heating the said reagent mixture without ignition thereof in said ante-chambers directly by heat produced in said



reaction chamber so that the temperature of said ante-chambers is above 600° C.;

passing essentially only said reagent mixture into said reaction chamber and decomposing said hydrocarbon material downstream from said ante-chambers in said reaction chamber to form carbon black, by a reaction which reaction includes partially burning said hydrocarbon material there at a temperature between 950° and 1200° C.;

passing the reaction products out of the reaction chamber at its exit end and then immediately cooling the reaction products by indirect heat exchange in successive first and second steps, said second cooling step serving to preheat at least a portion of said oxygen-containing gas and said first cooling step utilizing a cooling medium of which the flow is regulated so as to provide a temperature of said reaction products such as to quench the carbon black forming reaction after the performance of the first of said cooling steps but still sufficiently high to preheat the oxygen-containing gas in the second cooling step, and

separating carbon black from the gaseous reaction products.

4,112,061

PRODUCTION OF SODIUM SULFITE UTILIZING MOTHER LIQUOR FROM THE SODIUM METABISULFITE PROCESS

Robert Joel Hoffmann, Liverpool; Samuel Louis Bean, Jamesville; Philip Seeling, N. Syracuse, and James William Swaine, Jr., Manlius, all of N.Y., assignors to Allied Chemical Corporation, Morris Township; Morris County, N.J.

Continuation-in-part of Ser. No. 653,876, Jan. 30, 1976, Pat. No. 4,003,985. This application Aug. 3, 1976, Ser. No. 711,326

The portion of the term of this patent subsequent to Jan. 18, 1994, has been disclaimed.

Int. Cl.[2] C01D *5/14*

U.S. Cl. 423—512 A **14 Claims**

1. The process for making anhydrous sodium sulfite comprising:

(a) forming a saturated aqueous solution of sodium sulfite containing less than about 3 ppm of dissolved iron, basis the solution, and adjusting the pH of said solution to within the range of from about 6.5 to about 7.6;

(b) introducing into said solution substantially anhydrous sodium carbonate concurrently with mother liquor from which sodium metabisulfite crystals have been obtained by crystallization and a sulfur dioxide-containing gas stream, so proportioned with respect to each other as to maintain the pH of said solution within the range of from about 6.5 to about 7.6, while maintaining the temperature of said solution above about 35° C. to form a slurry of anhydrous sodium sulfite crystals; and

(c) separating anhydrous sodium sulfite crystals from said slurry.

4,112,062

EVAPORATION CONDENSATION SYSTEMS

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Continuation of Ser. No. 492,186, Jul. 26, 1974, abandoned, which is a division of Ser. No. 126,692, Mar. 22, 1971, Pat. No. 3,860,648. This application Jun. 29, 1976, Ser. No. 701,040

Int. Cl.[2] B01D *5/02*

U.S. Cl. 423—580 H **22 Claims**

1. A heat recovering evaporation-condensation process that produces, from a liquid containing a relatively non-volatile substance dissolved therein, a more concentrated solution of said substance and condensate of said liquid, which process comprises in combination:

(a) heating a flow of gas chemically different from said liquid and vaporizing thereinto said liquid to be carried thereby,

(b) thereafter subjecting said flow to treatment comprising further heating said flow and adding a further quantity of vapor of said liquid thereto, and

(c) subsequently cooling said flow and condensing said liquid therefrom

which combination further comprises

(d) effecting said heating and vaporizing step (a) in a first zone,

(e) effecting said cooling and condensing step (c) in a third zone and removing from said third zone said gas flow and liquid condensate.

(f) effecting said treatment step in a second zone,

(g) passing said flow in sequence through said first, second and third zones,

(h) bringing an amount of said liquid containing a concentration of said dissolved substance in solution therein into physical contact with said flow of gas in said first zone, said amount comprising a first quantity of said liquid that is vaporized into said gas in said first zone and a second quantity of said liquid which is not so vaporized, whereby said dissolved substance forms in said second quantity of liquid a more concentrated solution in said first zone.

(i) obtaining heat for effecting the heating and vaporizing in said first zone from the cooling and condensation in said third zone and transferring such heat to the flow in said first zone from the flow in said third zone by way of a countercurrent indirect contact heat exchange while maintaining said flows out of contact with each other,

(j) withdrawing said second quantity of more concentrated solution from said first zone, and

(k) recycling a portion of said withdrawn second quantity of more concentrated solution to comprise a part of said amount of liquid brought into said physical contact in step (h).

4,112,063
CONTINUOUS PRODUCTION OF IRON OXIDE HYDROXIDE

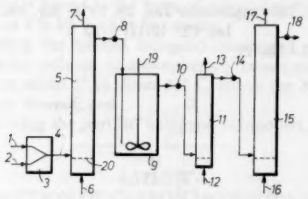
Gunter Buxbaum, and Franz Hund, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 3, 1976, Ser. No. 747,265

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1975, 2556406

Int. Cl.² C01G *49/02*

U.S. Cl. 423—633 **6 Claims**



1. In the production of an FeOOH seed suspension, comprising contacting an iron (II) salt solution with a basic precipitant to form a basic iron (II) salt or hydroxide suspension, oxidizing the salt or hydroxide, the precipitation and oxidation steps being carried out locally separate from one another, and recovering a suspension of FeOOH, the improvement which comprises continuously

(a) effecting the precipitation by mixing an about 1 to 20% by weight iron (II) salt solution with sufficient basic precipitant to precipitate about 25 to 95 atom % of the iron (II),

(b) at another location oxidizing the suspension obtained in (a) over a period of from about 0.5 to 5 hours at a temperature in the range from about 20° C. to 65° C. and until 10 to 50% of the precipitated iron (II) is oxidized,

(c) at another location oxidizing the suspension obtained in (b) with intensive mixing over a period of from about 0.01 to 1 hour to oxidize at least about 10% more of the iron (II) beyond step (b) until up to at most about 60% of the iron (II) precipitated in stage (a) is oxidized, and

(d) at another location substantially completely oxidizing the precipitated iron (II) still present over a period of from about 1 to 10 hours.

4,112,064
STABILIZED ANGIOTENSIN I SOLUTIONS

Bruce Charles Farrenkopf, Clifton, and Magdalena Usategui Gomez, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 22, 1977, Ser. No. 770,335

Int. Cl.² A61K *43/00*; G01N *33/16*

U.S. Cl. 424—1 **10 Claims**

1. A method for increasing the stability of an Angiotensin I or radioiodinated Angiotensin I solution containing buffer and stabilizer systems which method comprises adding to said solution a minor effective stabilizing amount of phenylmethylsulfonyl fluoride.

4,112,065
COMPOSITIONS OF BIS(ORTHO-SUBSTITUTED PHENYL)CARBODIIMIDES AND QUATERNARY AMMONIUM SALTS AND THEIR USE THEREOF IN COMBATTING ECTOPARASITIC TICK INFESTATIONS OF ANIMALS

Edgar Enders, Cologne; Wilhelm Stendel, Wuppertal, and Herbert Voege, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft

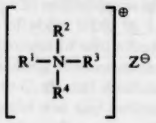
Filed Nov. 12, 1976, Ser. No. 741,214

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1975, 2553259

Int. Cl.² A01N *9/06, 9/20, 9/24*; A61K *9/04*

U.S. Cl. 424—45 **20 Claims**

1. A composition for combatting ectoparasitic ticks of domesticated animals comprising a tickicidally effective amount of a mixture of (a) a bis-(2-X-phenyl)carbodiimide in which X is alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 6 carbon atoms which carbodiimide is further unsubstituted or further substituted on each phenyl group with from one to three like or different substituents selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms and cycloalkyl of 3 to 6 carbon atoms and (b) from 0.05 to 3 parts by weight of said carbodiimide of a quaternary ammonium salt having a total of from 10 to 50 carbon atoms in its cation, said salt being of the formula:



wherein each of R^1, R^2, R^3 and R^4 are like or different unsubstituted or substituted hydrocarbon units selected from the group consisting of alkyl, cycloalkyl, aralkyl and aryl and $Z^\ominus$ is a monovalent anionic radical.

4,112,066
BREATH FRESHENER COMPOSITION AND METHOD

Ma'moun M. Hussein, Rye, N.Y., assignor to Life Savers, Inc., New York, N.Y.

Filed Jun. 21, 1976, Ser. No. 697,887

Int. Cl.² A61K *9/68, 7/16*

U.S. Cl. 424—48 **13 Claims**

1. A breath freshener composition consisting essentially of calcium hydroxide dispersed in a non-toxic carrier.

4,112,067
METHOD FOR TREATING POISON IVY DERMATITIS USING CERTAIN POLYAMINES AND POLYTERTIARYAMIDES

Donald A. Tomalia; Yancey J. Dickert, and Leslie P. McCarty, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 17, 1977, Ser. No. 769,479

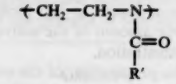
Int. Cl.² A61K *31/74*

U.S. Cl. 424—78 **8 Claims**

1. A method of treating and controlling dermatitis in humans caused by the exposure of the skin to a plant of the genus Rhus which comprises the topical application of an effective dermatitis alleviating amount of a polymer having a molecular weight of at least 5000 wherein said polymer is a polyamine of recurring units represented by the formula

wherein R represents hydrogen, a lower alkyl of from 1 to about 3 carbon atoms, or a substituted hydroxyl lower alkyl

having from 1 to about 3 carbon atoms; a polytertiaryamide of recurring units represented by the formula



wherein R' represents hydrogen or a lower alkyl of from 1 to about 3 carbon atoms; or a partially hydrolyzed polytertiaryamide prepared from a polytertiaryamide of the formula given above.

4,112,068

CANINE LUNG CELL STRAIN CULTURE SYSTEMS AND PROCESSES FOR THE CULTIVATION OF VIRUSES AND VACCINES THEREFROM

Victor J. Cabasso, Moraga, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 713,547, Aug. 11, 1976, abandoned, which is a continuation of Ser. No. 576,527, May 12, 1975, abandoned. This application Aug. 29, 1977, Ser. No. 828,369

Int. Cl.[2] **A61K** *39/12, 39/28;* **C12K** *9/00*

U.S. Cl. 424—89 **10 Claims**

1. A process for the preparation of a vaccine which comprises:

(a) maintaining a culture of diploid fibroblast-like cells of a finite cell strain derived from fetal canine lung tissue in a nutrient culture medium, said cells being free of reverse transcriptase and C-type particles, being free of adventitious viruses, being non-oncogenic, and remaining diploid throughout their passage range;

(b) inoculating said medium with a virus selected from the group consisting of rabies virus, infectious bovine rhinotracheitis virus, canine distemper virus, type 3 parainfluenza virus and bluetongue virus;

(c) cultivating said virus in said medium; and,

(d) recovering a harvest of said virus therefrom.

4,112,069

TREATMENT OF RUMINANTS

Thomas L. Huber, Watkinsville, Ga., assignor to Research Corporation, New York, N.Y.

Filed Sep. 4, 1975, Ser. No. 610,337

Int. Cl.[2] **A61K** *37/00;* **C12B** *1/00;* **A01K** *45/00, 67/00*

U.S. Cl. 424—93 **19 Claims**

1. A method of treating a ruminant animal which had previously subsisted on a substantially hay diet or by range foraging to avoid or overcome lactic acidosis when said ruminant animal is fed for fattening a high energy ration or diet which comprises administering to said ruminant animal a culture of the microorganism *Peptococcus asaccharolyticus* to establish a growth of said microorganism in the rumen of said ruminant animal to avoid or overcome lactic acidosis.

4,112,070

BLOOD PRESERVATION SYSTEM

Denise M. Harmening, Ellicott City, Md., assignor to Research Corporation, New York, N.Y.

Filed Jun. 8, 1977, Ser. No. 804,603

Int. Cl.[2] **A61K** *35/14, 35/18;* **C12B** *3/00*

U.S. Cl. 424—101 **24 Claims**

1. In a composition of matter comprising metabolizing erythrocytes in an in vitro environment capable of supporting erythrocyte metabolism, the improvement which comprises a water-insoluble polymer containing releaseable phosphate ions for supplying a physiologically acceptable, continuous, sustained release source of metabolizable phosphate to said erythrocytes in an amount sufficient to maintain both 2,3DPG and ATP levels at least equal to those of freshly drawn blood for a storage period equivalent to 28 days of storage at 4° C.

4,112,071

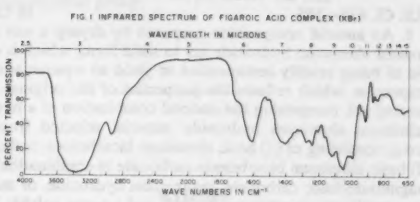
ANTIBIOTIC COMPLEX

William T. Bradner, Manlius; James A. Bush, Fayetteville, and Donald E. Nettleton, Jr., Jordan, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 758,248, Jan. 10, 1977, abandoned, which is a continuation-in-part of Ser. No. 590,994, Jun. 27, 1975, abandoned. This application Sep. 9, 1977, Ser. No. 832,034

Int. Cl.[2] **A61K** *35/00*

U.S. Cl. 424—118 **6 Claims**



6. The anthracycline anitbiotic complex, figaroic acid complex, or a pharmaceutically acceptable salt thereof, which antibiotic complex has the following characteristics:

(a) it is an orange-red amorphous solid in the free acid state and an amorphous deep purple solid when recovered under alkaline conditions;

(b) it is soluble in dimethylformamide and dimethylacetamide, mostly soluble in lower alcohols, acetone, tetrahydrofuran and dioxane and insoluble in diethyl ether, benzene and aliphatic hydrocarbons;

(c) it is capable of forming salts with bases;

(d) it is soluble in aqueous $NaHCO_3$ and $Ba(OH)_2$ giving, respectively, red-violet and blue solutions;

(e) it gives a deep red solution having red fluorescence with alocoholic magnesium acetate and a black solution with alcoholic ferric chloride;

(f) it gives a positive Tollens test;

(g) it gives no color change with acidic zinc dust, acidic sodium bisulfite or acidic hydrogen peroxide;

(h) it shows a slight fading of color with alkaline zinc dust from violet to red, a rapid change in color from violet to red with alkaline sodium bisulfite and no color change with alkaline hydrogen peroxide except in large excess whereupon the color fades from violet to pink;

(i) it has an infrared spectrum when pelleted in potassium bromide substantially as shown in FIG. 1;

(j) it has ultraviolet absorption spectra when dissolved in 0.1 HCl in methanol and 0.1N NaOH in methanol, respectively, at a concentration of 50 μg/ml. substantially as shown in FIG. 2;

(k) it is effective in inhibiting the growth of various Gram-positive bacteria, protozoa and yeasts;

(l) it is effective in inhibiting the growth of Sarcoma 180, L-1210 lymphatic leukemia, Walker 256 carcinosarcoma, P-388 lymphatic leukemia and B-16 melanoma tumor systems in rodents;

(m) it exhibits phage inducing properties;

(n) it contains the elements carbon, hydrogen, oxygen and nitrogen in substantially the following percentages by weight: carbon 53.82%, hydrogen 5.85%, nitrogen 1.63% and oxygen (by difference) 38.70%; an

(o) it exhibits the following R_f values as determined by silica gel thin layer chromatography:

1. in the solvent system chloroform: methanol (19:1) — R_f's of 0.0, 0.39, 0.214, 0.243, 0.349, 0.470, 0.612, 0.651 and 0.694.

2. in the solvent system chloroform: methanol: formic acid

(90:10:1) — R_f's of 0.0, 0.043, 0.73, 0.149, 0.169, 0.212, 0.272, 0.308, 0.368, 0.467, 0.523, 0.722, 0.795 and 0.825; and

3. in the solvent system chloroform: methanol: formic acid (80:20:1) — R_f's of 0.0, 0.200, 0.233, 0.279, 0.311, 0.446, 0.472, 0.508, 0.622, 0.741, 0.839, 0.892 and 0.928.

4,112,072
RESUSPENDABLE DRIED ANTACIDS

Andrew M. Rubino, New Providence, and Jack J. Margres, Old Bridge, both of N.J., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 252,816, May 12, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,226

Int. Cl.[2] A61K *33/12, 33/10, 33/08*

U.S. Cl. 424—155 **18 Claims**

1. An antacid composition prepared by drying a wet compressed aluminum hydroxide gel to solid form, which is capable of being readily resuspended to yield an opaque aqueous suspension which reflects the properties of the original compressed gel, comprising the codried combination of a hydrous gelatinous aluminum hydroxide material selected from the group consisting of (1) basic aluminum bicarbonate-carbonate, (2) basic aluminum bicarbonate-carbonate in combination with magnesium basic carbonate, magnesium hydroxide, or magnesium trisilicate, or mixtures thereof, and a water soluble food-grade di- or trihydroxy alcohol suitable for oral ingestion, wherein analysis of the dried product yields a figure in the range of from 30–60 percent by weight for the sum of aluminum hydroxide and magnesium hydroxide calculatd as Al_2O_3 and MgO and shows that there is also present at least 0.3 mol of carbonate calculated as CO_2 for each mol of Al_2O_3.

4,112,073
MEDICINAL COMPOSITION COMPRISING ADRENAL CORTICAL HORMONE AND THYROID STIMULATING HORMONE RELEASING HORMONE

Hiroomi Ono, Chofu, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 8, 1976, Ser. No. 721,547

Claims priority, application Japan, Sep. 9, 1975, 50-109777; Mar. 15, 1976, 51-28290

Int. Cl.[2] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **14 Claims**

1. A medicinal composition for increasing the therapeutic effect of an adrenal cortical hormone which comprises an effective amount of an adrenal cortical hormone selected from the group consisting of 9α-fluorocortisone, 9α-fluorocortisol, prednisone, prednisolone, triamcinolone, medrol, dexamethasone, betamethasone, paramethasone, flumethasone and physiologically acceptable esters and salts thereof, and a thyroid stimulating hormone-releasing hormone selected from the group consisting of L-pyroglutamyl-L-histidyl-L-prolinamide, L-2-oxooxazolidine-4-carbonyl-L-hystidyl-L-prolinamide, L-trans-5-methyl-2-oxooxazolidine-4-carbonyl-L-histidyl-L-prolinamide, L-2-oxothiazolidine-4-carbonyl-L-histidyl-L-prolinamide and physiologically acceptable salts thereof, the ratio of the adrenal cortical hormone to the thyroid stimulating hormone-releasing hormone being about 1 (dexamethasone equivalent): 0.05 to 5 and a acceptable carrier.

4,112,074
COMPOSITIONS COMPRISING OVOMUCOID FRACTION OF WHITE OF QUAIL'S EGG

Jean-Claude Truffier, 67 rue Thiers, 17300 Rochefort; Gérard Lucotte, 69 avenue F. Mollet, 92160 Antony, and Raymond Cordonnier, Le Vergeroux, 17300 Rochefort, all of France

Filed Jun. 27, 1977, Ser. No. 810,638

Claims priority, application France, Jun. 29, 1976, 76 19751

Int. Cl.[2] A61K *37/02, 35/54*

U.S. Cl. 424—177 **4 Claims**

1. An ovomucoid fraction of the white of quails eggs, which exhibits an anti-cattle-trypsin-activity of the order of 100 units per mg and consists essentially of a postovalbumin and of a protein corresponding to protein Y, according to the proteinogram obtained by electrophoresis on starch gel.

2. As a medicament, useful in the treatment of allergies comprising an effective amount of the active fraction of claim 1 in a carrier for adminstration.

3. A process for the preparation of the ovomucoid fraction of the white of quails eggs as claimed in claim 1, characterized in that it comprises the following stages:

after adding to the white of egg one volume of a solution of trichloroacetic acid in acetone, containing 1 volume of 0.5 M trichloroacetic acid per 2 volumes of acetone, the mixture is allowed to settle at 4° C. and after 48 hours the clear supernatant liquid is separated off,

the anti-protease fraction is precipitated by adding from 2 to 3 volumes of acetone to the supernatant liquid and the precipitate is filtered off; and

the precipitate is dissolved in water and dialyzed to remove the excess trichloroacetic acid, after which it is reprecipitated with acetone, washed with acetone and ether and dried at ambient temperature.

4,112,075
FURANOSE-O-PYRIDYLCARBOXYLIC ACID ESTERS

Gerhard Baschang, Bettingen; Alex Sele, Muttenz; Jaroslav Stanek, Birsfelden, and Alberto Rossi, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

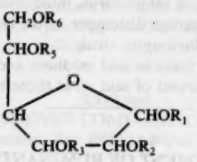
Filed Sep. 9, 1976, Ser. No. 721,738

Claims priority, application Switzerland, Sep. 12, 1975, 11893/75

Int. Cl.[2] A61K *31/70;* **C07H** *15/04*

U.S. Cl. 424—180 **10 Claims**

1. A furanose-O-pyridylcarboxylic acid ester of the formula I



(I)

in which at least one of R_1, R_2, R_3, R_5 and R_6 is pyridylcarbonyl and the remainder of R_1, R_2, R_3, R_5 and R_6 are lower alkyl, lower alkenyl, phenyl-lower alkyl, halogenophenyl-lower alkyl, trifluoromethylphenyl-lower alkyl, lower alkylphenyl-lower alkyl, lower alkoxyphenyl-lower alkyl or hydrogen, or in which OR_1 is hydrogen.

10. A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 1 together with a pharmaceutically usable excipient.

4,112,076
EPI-DAUNOMYCIN AND EPI-ADRIAMYCIN COMPOUNDS AND METHOD OF USE

Federico Arcamone, Nerviano, Milan; Alberto Bargiotti, Milan; Aurelio di Marco, Milan, and Sergio Penco, Milan, all of Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

Filed Apr. 9, 1976, Ser. No. 675,696

Claims priority, application United Kingdom, Apr. 30, 1975, 18098/75

Int. Cl.[2] A61K *31/70;* **C07H** *15/24*

U.S. Cl. 424—180 **8 Claims**

8. A method of inhibiting the growth of a tumor selected from the group consisting of Moloney Sarcoma Virus, Ascites lymphocitic P. 388 leukemia, L1210 leukemia, Ascites Sarcoma 180 and Solid Sarcoma 180 which comprises intraperitoneally administering to a host afflicted with said tumor an amount of a compound selected from the group consisting of

3'-4'-epi-6'-hydroxy-daunomycin; 3'-4'-epi-6'-hydroxy-adriamycin; 3'-4'-epi-duanomycin; 3'-4'-epi-adriamycin; 4-demethoxy-4'-epi-daunomycin and 4-demethoxy-4'-epi-adriamycin sufficient to inhibit the growth of said tumor.

4,112,077
DIAZABORINES AND DRUG COMPOSITIONS

Hubert Maria Agnes van Wersch, Ruysdaelstraat 33, Kerkrade, Netherlands; Siegfried Herrling, Dohlenweg 33 (BRD), Stolberg, and Heinrich Muckter, Am Chorusberg 51 (BRD), Aachen, both of Germany

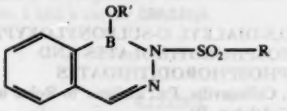
Filed Jul. 26, 1976, Ser. No. 708,361

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1975, 2533918; May 11, 1976, 2620776; May 11, 1976, 2620777

Int. Cl.² A61K *31/69*

U.S. Cl. 424—185 **30 Claims**

1. New derivatives of 1-hydroxy-benzo-2,3,1-diazaborine of the formula



(I)

herein R is an acyclic alkyl or alkenyl radical having 2 to 5 carbon atoms, or R is a mono-, di- or tri-halogen methyl radical and wherein R' is a hydrogen or a cation which together with and in formula (I), is pharmaceutically acceptable and effective to control gram-negative bacteria.

21. A pharmaceutical composition which comprises an effective amount for controlling gram-negative bacteria of a compound of claim 1, or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable carrier.

4,112,078
ISOLATION OF UTEROEVACUANT SUBSTANCES FROM PLANT EXTRACTS

Robert H. K. Chen, Belle Mead, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Aug. 8, 1977, Ser. No. 822,478

Int. Cl.² A61K *35/78, 31/335;* C07D *301/00;* C07G *17/00*

U.S. Cl. 424—195 **21 Claims**

1. The method of purifying residues containing biologically-active materials obtained by extraction of the zoapatle plant which comprises the steps of:

treating the residue with an acylating agent selected from the group consisting of aliphatic acyl halides and aliphatic acid anhydrides having 1–10 carbon atoms in the acyl group in the presence of a base selected from the group consisting of trialkylamines, pyridine, N,N-dimethylanaline and N,N-diethylanaline, reacting the resultant mixture first with a reducing agent selected from the group consisting of sodium borohydride and lithium tritertiarybutoxy aluminum hydride and then with manganese dioxide and separating the components of the mixture to yield a first compound having two acyl groups and a keto group and a second compound having two acyl groups and a hydroxyl group.

4,112,079
ISOLATION OF UTEROEVACUANT SUBSTANCES FROM PLANT EXTRACTS

Robert H. K. Chen, Belle Mead, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Aug. 8, 1977, Ser. No. 822,479

Int. Cl.² A61K *35/78, 31/335;* C07G *17/00;* C07D *301/00*

U.S. Cl. 424—195 **19 Claims**

1. The method of purifying residues containing biologically-active materials obtained by extraction of the zoapatle plant which comprises the steps of:

treating the residue with an acylating agent selected from the group consisting of aliphatic acyl halides and aliphatic acid anhydrides having 1-10 carbon atoms in the acyl group in the presence of a base selected from the group consisting of trialkylamines, pyridine, N,N-dimethylanaline and N,N-diethylanaline, reacting the resultant mixture with a hydrocyanating agent selected from the group consisting of an alkali metal cyanide and a strong mineral acid, and acetone cyanohydrin and an alkali metal carbonate, and separating the components of the mixture to yield a first compound having two acyl groups and a keto group and a second compound having two acyl groups and a cyanohydrin group.

4,112,080
O-ALKYL-S-[1,6-DIHYDRO-6-OXO-PYRIDAZIN(1)YL-METHYL]-(THIONO)-(DI)-THIOLPHOSPHORIC(PHOSPHONIC) ACID ESTERS

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel; Lothar Rohe, all of Wuppertal; Ingeborg Hammen, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

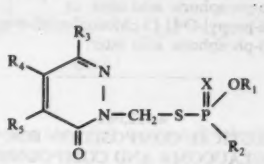
Continuation of Ser. No. 451,321, Mar. 13, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 645,984

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1974, 2316821

Int. Cl.² A01N *9/36;* C07F *9/65*

U.S. Cl. 424—200 **10 Claims**

1. An S-[1,6-dihydro-6-oxo-pyridazin(1)ylmethyl]-(thiono)-(di)-thiol-phosphoric(phosphonic) acid ester of the formula



in which

R_1 is alkyl or alkoxyalky having 1 to 6 carbon atoms per alkyl chain,

R_2 is alkyl, alkylmercapto, alkylamino or alkenylamino having up to 6 carbon atoms per aliphatic chain, amino or phenyl,

R_3 is alkoxy, cyanoalkoxy, carbalkoxy-alkoxy, alkenyloxy, alkynyloxy, alkanoyloxy, dialkylcarbamoyloxy or alkylsulfonyloxy having up to 5 carbon atoms in each aliphatic chain, halogen, hydroxyl, or a (thiono) (thiol)-phosphoric(phosphonic) acid ester or esteramide radical,

R_4 and R_5 each independently is hydrogen, alkyl having 1 to 3 carbon atoms or halogen, or R_4 and R_5 conjointly form a fused benzene ring, and

X is oxygen or sulfur.

9. A method of combating insects, acarids or nematodes which comprises applying to *Phaedon larvae, Myzus, Tetranychus urticae, Phorbia brassicae, Tenebrio m. larvae, Meloidogyne incognita, Rhopalosiphum, Drosophila melanogaster, Plutella* or *Euscelis bilobatus,* or to a habitat thereof, an insecticidally, acaricidally or nematocidally effective amount of a compoun according to claim 1.

4,112,081
O,O-DI-ALKYL-O-(1-6-PYRIDAZINON-3-YL)-(THIONO)-PHOSPHORIC ACID ESTERS AND THEIR PESTICIDAL USE

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel, all of Wuppertal; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Overath-Steinenbrueck, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 9, 1976, Ser. No. 694,417

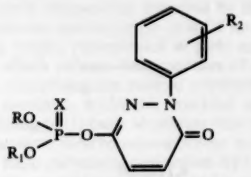
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1975, 2528692

Int. Cl.[2] A01N 9/36

U.S. Cl. 424—200 **8 Claims**

1. An O,O-dialkyl-O-(1-phenyl-6-pyridazinon-3-yl)-(thiono)-phosphoric acid ester of the formula

(I)



in which

R is methyl or ethyl,

R_1 is alkyl with 3 or 4 carbon atoms, methoxymethyl or ethoxyethyl, and

R_2 is hydrogen, nitro, chlorine, methyl or ethyl.

8. The method of combating insect or acarid pests which comprises applying to the pests or a habitat thereof an insecticidally or acaricidally effective amount of

O-methyl-O-n-propyl-O-(1-phenyl-6-pyridazinon-3-yl)-thiono-phosphoric acid ester,

O-ethyl-O-iso-propyl-O-(1-phenyl-6-pyridazinon-3-yl)-thiono-phosphoric acid ester,

O-methyl-O-n-propyl-O-[1-(3-nitrophenyl)-6-pyridazinon-3-yl]-thiono-phosphoric acid ester,

O-ethyl-O-n-propyl-O-[1-(3-nitrophenyl)-6-pyridazinon-3-yl]-thiono-phosphoric acid ester, or

O-ethyl-O-n-propyl-O-[1-(3-chlorophenyl)-6-pyridazinon-3-yl]-thiono-phosphoric acid ester.

4,112,082
PHARMACEUTICAL COMPOSITION FOR TREATING GLAUCOMA AND COMPOUND 1,3,2-DIOXAPHOSPHERINGNES

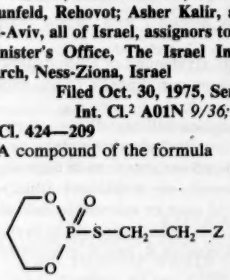
Yacov Ashani, Rishon Lezion; Gavriel Amitai, Tel-Aviv; Yona Grunfeld, Rehovot; Asher Kalir, and Sasson Cohen, both of Tel-Aviv, all of Israel, assignors to The State of Israel, Prime Minister's Office, The Israel Institute for Biological Research, Ness-Ziona, Israel

Filed Oct. 30, 1975, Ser. No. 627,387

Int. Cl.[2] A01N 9/36; C07F 9/21

U.S. Cl. 424—209 **9 Claims**

1. A compound of the formula



wherein Z designated a group -NRR' or $-N^+RR'R''.X^-$, where R designates hydrogen or lower alkyl of up to, and including, 4 carbon atoms R' designates lower alkyl of up to, and including, 4 carbon atoms, and R'' designates hydrogen, methyl or ethyl, and where X^- is a physiologically acceptable anion.

2. A pharmaceutical composition for treating glaucoma, comprising a compound in accordance with claim 1 and a pharmaceutically acceptable carrier, said compound being present in an amount effective for the treatment of glaucoma.

3. A method of using the composition of claim 2 comprising administering said composition to the eye of mammals having glaucoma in an amount sufficient to treat the glaucoma, wherein said pharmaceutically acceptable carrier is an ophthalmological carrier.

4,112,083
PESTICIDAL O,S-DIALKYL O-SULFONYLOXYPHENYL PHOSPHOROTHIOLATES AND PHOSPHORODITHIOATES

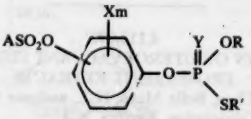
William S. Hurt, Collegeville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 680,626, Apr. 26, 1976, Pat. No. 4,053,499, which is a division of Ser. No. 576,838, May 12, 1975, Pat. No. 3,975,420, which is a continuation-in-part of Ser. No. 519,448, Oct. 31, 1974, abandoned. This application Jul. 26, 1977, Ser. No. 819,079

Int. Cl.[2] A01N 9/36

U.S. Cl. 424—215 **6 Claims**

1. A pesticidal composition wherein the pests are acarids, insects, nematodes, or phytopathogenic fungi, comprising an effective amount of a compound of the formula



wherein

R is a $(C_1–C_4)$alkyl group;

R' is a $(C_3–C_6)$alkyl group;

Y is an oxygen atom or a sulfur atom;

X is a halogen atom, a $(C_1–C_3)$alkyl group, or a $(C_1–C_3)$alkoxy group;

m is an integer from 0 to 3;

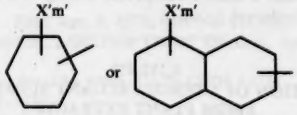
A is

a. a $(C_1–C_5)$alkyl group substituted with up to three halogen atoms;

b. a $(C_5–C_6)$cycloalkyl group;

c. a $(C_7–C_{10})$aralkyl group, the aryl portion of which is optionally substituted with up to three nitro groups, halogen atoms, $(C_1–C_3)$alkyl groups, or $(C_1–C_3)$alkoxy groups; or

d. an aryl group of the formula



wherein

X' is a nitro group, a halogen atom, a $(C_1–C_3)$alkyl group, or a $(C_1–C_3)$alkoxy group; and

m' is an integer from 0 to 3; and an agronomically acceptable carrier.

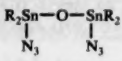
4,112,084

BACTERICIDAL AND FUNGICIDAL TIN COMPOUNDS

Hans Plum, Hamm-Heessen, and Ulrich Schroeer, Kamen-Methler, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Nov. 22, 1977, Ser. No. 853,854
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659288
Int. Cl.[2] A01N *9/20;* C07C *117/00*
U.S. Cl. 424—226 6 Claims

1. A bis-(azido-di-alkyl-tin)-oxide of the formula



wherein R is alkyl having 3–5 carbon atoms.

6. A bactericidal or fungicidal composition comprising a bactericidally- or fungicidally-effective amount of a compound as in claim 1 and a carrier therefor.

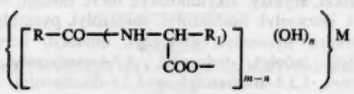
4,112,085

METALLIC COMPOSITIONS

Jean V. Morelle, and Eliane M. T. Lauzanne-Morelle, both of 170 Avenue Parmentier, 75010 Paris, France

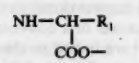
Division of Ser. No. 621,954, Oct. 14, 1975. This application Nov. 25, 1977, Ser. No. 855,050
Claims priority, application France, Oct. 28, 1974, 74 35929
Int. Cl.[2] A61K *31/555, 31/28, 31/16*
U.S. Cl. 424—245 2 Claims

1. A composition of the formula



wherein:

(a) R-CO is the acyl moiety of a straight fatty acid RCOOH comprising from 6 to 20 carbon atoms;



(b)

represents the ensemble of skeletons of all the aminoacids obtained by complete hydrolysis of the natural proteins, said compositions containing the alpha aminoacids in proportions similar to those ones existing in the proteins treated;

(c) M is a metal selected from the group consisting of magnesium, calcium, iron, cobalt, manganese, copper, zinc, molybdenum and aluminium;

(d) *m* is the valency of the selected M; and

(e) *n* is an integer inferior to *m*.

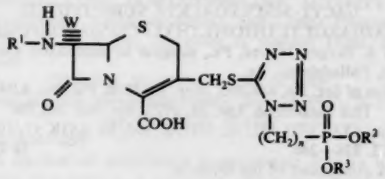
4,112,086

7β-ACYLAMINO-3-(PHOSPHONOALKYL AND ESTERIFIED PHOSPHONOALKYL SUBSTITUTED TETRAZOLYLTHIOMETHYL)CEPHALOSPORINS

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Nov. 2, 1976, Ser. No. 737,971
Int. Cl.[2] C07D *501/60;* A61K *31/545*
U.S. Cl. 424—246 57 Claims

1. An antibacterial compound of the formula:



in which:

W is hydrogen or methoxy;

R^1 is a pharmaceutically acceptable acyl group known as a 7-substituent in the cephalosporin art;

R^2 and R^3 are each hydrogen or alkyl of from one to four carbon atoms; and

n is 1 to 5,

or a non-toxic pharmaceutically acceptable salt or hydrate thereof.

47. A pharmaceutical composition having anti-bacterial activity comprising a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

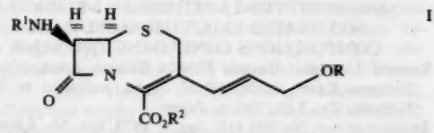
4,112,087

CEPHALOSPORIN TYPE ANTIBACTERIALS HAVING A SUBSTITUTED PROPENYL GROUP IN THE 3-POSITION

Philip J. Beeby, Melbourne, Australia, assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 4, 1976, Ser. No. 738,776
Int. Cl.[2] C07D *501/24;* A61K *31/38*
U.S. Cl. 424—246 34 Claims

1. A compound having the formula:

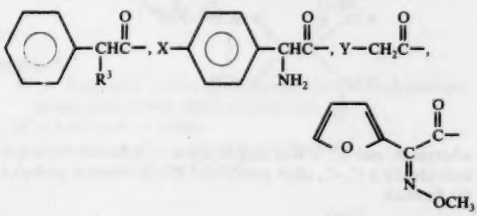


I

wherein:

R is alkyl having 1 to 4 carbon atoms, β-haloethyl, cyclopentyl or benzyl;

R^1 is a group having the formula



wherein

R^3 is hydrogen, hydroxy or carboxy; X is hydrogen or hydroxy; Y is thiophen-2-yl, (1H)-tetrazol-1-yl, 4-pyridylthio, phenoxy, trifluoromethylthio, 4-nitrophenyl or 3-chlorophenyl;

R^2 is hydrogen or a protecting group selected from the group benzhydryl, benzyl, o-nitrobenzyl, p-nitrobenzyl, 3,5-dinitrobenzyl, p-methoxybenzyl, tert-butyl, pivaloyloxymethyl, phenacyl, and polyhaloalkyl having 2 to 6 carbon atoms; and pharmaceutically acceptable salts thereof.

4,112,088

7-ACYL-3-(SULFOALKYL SUBSTITUTED OXADIAZOLYLTHIOMETHYL) CEPHALOSPORINS

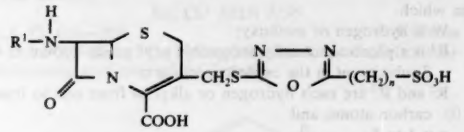
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 666,095, Mar. 11, 1976, Pat. No. 4,041,162. This application Apr. 25, 1977, Ser. No. 790,738

Int. Cl.[2] **C07D** *501/56, 501/52, 501/50;* **A61K** *31/395*

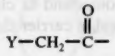
U.S. Cl. 424—246 **10 Claims**

1. A compound of the formula:



in which:

R^1 is an acyl group of the formula:



where:

Y is cyano, aminomethylphenyl, sydnone, pyridone, thienyl or tetrazolyl; and

n is 1 to 5,

or a non-toxic pharmaceutically acceptable salt thereof.

4. A method of treating bacterial infections comprising administering internally by injection to an infected or susceptible warm-blooded animal a composition containing an antibacterially effective but nontoxic dose of a compound as claimed in claim **1**.

4,112,089

4-SUBSTITUTED-1,3-DITHIOLAN-2-YLIDENE MALONATES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

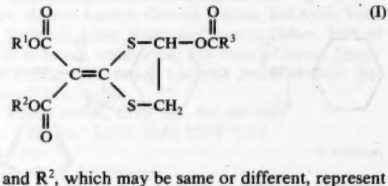
Kuniaki Taninaka, Ibaragi; Hitoshi Kurono, Amagasaki, and Tsutomu Kasai, Sakai, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

Division of Ser. No. 584,410, Jun. 6, 1975, Pat. No. 4,034,102. This application Feb. 8, 1977, Ser. No. 766,818

Int. Cl.[2] **C07D** *339/06, 413/02;* **A61K** *31/40, 31/535*

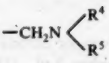
U.S. Cl. 424—248.55 **24 Claims**

1. A compound represented by the general formula (I),



(I)

wherein R^1 and R^2, which may be same or different, represent individually a C_1–C_4 alkyl group; and R^3 represents a group of the formula



(where R^4 and R^5 form, in combination, a lower alkylene group which is sometimes intercepted by an oxygen atom).

6. A pharmaceutical composition for preventing liver necrosis, fatty liver or hepatitis of animals including humans, which comprises an effective amount sufficient for said purpose of a compound having the general formula (I) defined in claim **1**, and a pharmaceutically acceptable diluent.

4,112,090

NOVEL PENICILLINS AND CEPHALOSPORINS AND PROCESS FOR PRODUCING THE SAME

Isamu Saikawa; Shuntaro Takano, both of Toyama; Chosaku Yoshida, Takaoka; Okuta Takashima, Toyama; Kaishu Momonoi, Shinminato; Seietsu Kuroda, Toyama; Miwako Komatsu, Toyama; Takashi Yasuda, Toyama, and Yutaka Kodama, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

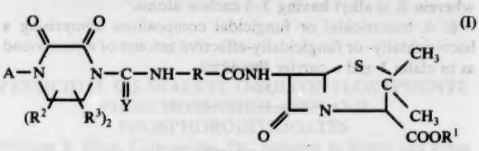
Continuation-in-part of Ser. No. 571,479, Apr. 24, 1975, Pat. No. 4,087,424. This application Jan. 30, 1976, Ser. No. 654,060

Claims priority, application Japan, May 9, 1974, 49-50663; May 13, 1974, 49-52254; May 31, 1974, 49-60787; Aug. 13, 1974, 49-91996; Sep. 26, 1974, 49-109954; Dec. 13, 1974, 49-142499

Int. Cl.[2] **A61K** *31/43;* **C07D** *499/70, 499/66, 499/68*

U.S. Cl. 424—251 **40 Claims**

1. An antibacterial compound of the formula (I),



(I)

wherein R is a group represented by the formula

wherein R^5 represents a conventional penicillin substituent selected from alkyl, cycloalkyl, cycloalkenyl, cycloalkadienyl, aryl, aralkyl, aryloxy, alkylthioalkyl, furyl, thienyl, oxazolyl, thiazolyl, isoxazolyl, isothiazolyl, imidazolyl, pyrazolyl, pyridyl, pyrazyl, pyrimidyl, pyridazyl, quinolyl, isoquinolyl, quinazolyl, indolyl, indazolyl, 1,3,4-oxadiazolyl, 1,2,4-oxadiazolyl, 1,3,4-thiadiazolyl or 1,2,4-thiadiazolyl, each of which may be substituted by halogen, hydroxy, nitro, alkyl, alkoxy, alkylthio, acyl or alkylsulfonylamino; R^6 represents a hydrogen atom; and R^5 and R^6 together with a common carbon atom may form a conventional penicillin substituent selected from cycloalkyl, cycloalkenyl or cycloalkadienyl ring;

R^1 represents a hydrogen atom, a conventional penicillin blocking group of a conventional penicillin or a conventional salt-forming cation of a conventional penicillin;

each pair of R^2 and R^3 are linked to the same carbon atom, and each R^2 and R^3 in each pair of R^2 and R^3, which may be the same or different, represent individually a conventional penicillin substituent selected from the group consisting of hydrogen, halogen, carboxyl, or alkyl, cycloalkyl, aryl, acyl, aralkyl, alkoxycarbonylalkyl, acyloxyalkyl, alkoxy, alkoxycarbonyl, cycloalkyloxycarbonyl, aralkoxycarbonyl, aryloxycarbonyl, amino or carbamoyl; any of which may be substituted by halogen, alkyl, alkoxy, alkylthio, acyl or nitro; and any pair of R^2 and R^3 together with a common carbon atom may form a conventional penicillin substituent which is a cycloalkyl ring;

A represents a conventional penicillin substituent selected from hydrogen, hydroxy, nitro or cyano, or alkyl, alkenyl, alkynyl, alkadienyl, cycloalkyl, cycloalkenyl, cycloalkadienyl, aryl, acyl aralkyl, acyloxyalkyl, alkoxy, cycloalkyloxy, alkoxycarbonyl, aryloxy, cycloalkyloxycarbonyl, aryloxycarbonyl, aralkoxycarbonyl, alkylsulfonyl, cycloalkylsulfonyl, arylsulfonyl, carbamoyl, thiocarbamoyl, acylcarbamoyl, acylthiocarbamoyl, alkylsulfonylcarbamoyl, arylsulfonylcarbamoyl, alkylsulfonylthiocarbamoyl, arylsulfonlthiocarbamoyl, sulfamoyl, alkoxycarbonylthioalkyl, alkoxythiocarbonylthioalkyl, amino, thiazolyl, pyridyl, pyridazyl, pyrazyl, thiadiazolyl, triazolyl, tetrazolyl or quinolyl, each of which may be substituted by a

conventional penicillin substituent selected from the group consisting of halogen, hydroxyl, alkyl, alkoxy, alkylthio, nitro, cyano, amino, carboxyl or acyl; and

Y represents an oxygen or sulfur atom.

4,112,091

POLYHALO ALKYL OR ALKENYL ALCOHOL ESTERS OF PIPERAZINO ACIDS

Hans Nesvadba, Vienna, Austria, and Hellmuth Reinshagen, Rheinweiler, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

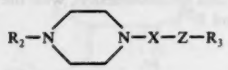
Filed Apr. 4, 1977, Ser. No. 783,989

Claims priority, application Switzerland, Apr. 9, 1976, 4529/76; Apr. 9, 1976, 4530/76

Int. Cl.[2] C07D *295/18;* **A61K** *31/495*

U.S. Cl. 424—250 **11 Claims**

1. A compound of formula I



I

in which

R_2 is hydrogen, lower alkyl, lower hydroxyalkyl, phenyl, mono lower alkyl phenyl or monohydroxy lower alkyl phenyl,

X is a group of formula $>C=O$ or $>C=S$,

Z is oxygen or sulphur, and

R_3 is a straight- or branched-chain alkyl of 1 to 12 carbon atoms or an alkenyl group of 2 to 6 carbon atoms, which is substituted at one methyl group by two or three halogen atoms.

10. An animal feed containing a compound of claim **1**, in free base form or in physiologically acceptable acid addition salt form, in an amount effective to improve food utilisation.

4,112,092

1-NAPHTHYLMETHYL-4-(THIAZOLYL-2)-PIPERAZINES

Gilbert Regnier, Chatenay-Malabry; Roger Canevari, Elancourt, and Jean-Claude Poignant, Bures, Yvette, all of France, assignors to Science Union et Cie, France

Filed Apr. 8, 1977, Ser. No. 785,855

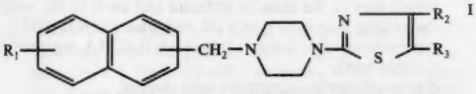
Claims priority, application United Kingdom, Apr. 12, 1976, 14811/76

Int. Cl.[2] C07D *417/04;* **A61K** *31/495*

U.S. Cl. 424—250 **6 Claims**

1. A compound selected from the group consisting of:

(A) naphthyl compounds of the formula I:



I

wherein:

R_1 is selected from the group consisting of hydrogen, halogen, i.e. chlorine, fluorine, or bromine, lower-alkyl and lower-alkoxy, each having 1 to 5 carbon atoms inclusive,

R_2 and R_3, which are the same or different, are selected from the group consisting of hydrogen, lower-alkyl having 1 to 5 carbon atoms inclusive and phenyl and

R_2 and R_3 joined together are $-CH=CH-CH=CH-$ in order to form with the thiazolyl radical to which they are bonded a benzothiazolyl radical; and

(B) physiologically tolerable acid addition salts thereof.

5. A pharmaceutical composition useful for treating CNS disorders containing as active ingredient a compound of claim **1** in an amount of 15 to 150 mg, together with a suitable pharmaceutical carrier.

4,112,093

STIMULATING DOPAMINERGINIC ACTIVITY

Claude Dumont, Nogent-sur-Marne, and Claude Oberlander, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Filed Jun. 16, 1977, Ser. No. 807,068

Claims priority, application France, Jun. 23, 1976, 76 19088

Int. Cl.[2] A61K *31/495*

U.S. Cl. 424—250 **3 Claims**

1. A method of stimulating dopaminergic activity in the treatment of neurological syndromes of extrapyramidal origin in warm-blooded animals comprising administering to warm-blooded animals an dopaminergically effective amount of a member of the group consisting of N-(3,4-methylenedioxybenzyl)-N'-(2-pyridyl)-piperazine and a non-toxic, pharmaceutically acceptable acid additional salt thereof and an inert pharmaceutical carrier.

4,112,094

N-(2-PYRAZINYL) 1H- (OR 2H) TETRAZOLE-5-CARBOXAMIDE DERIVATIVES FOR THE PREVENTION OF IMMEDIATE TYPE HYPERSENSITIVITY REACTIONS

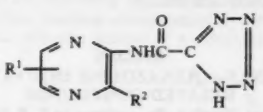
John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, both of Pa., and Albert J. Begany, Tuscon, Ariz., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 669,562, Mar. 23, 1976, Pat. No. 4,044,144, which is a continuation-in-part of Ser. No. 542,465, Jan. 20, 1976, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, Mar. 23, 1973, abandoned. This application Jul. 15, 1977, Ser. No. 815,972

Int. Cl.[2] A61K *31/495;* **C07D** *403/02*

U.S. Cl. 424—250 **6 Claims**

1. A process for preventing the release of pharmacological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivitis, food allergy and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:



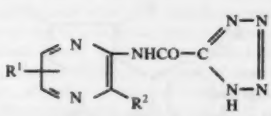
in which

R^1 is hydrogen, lower alkylamino, di(lower)alkylamino, cyano, halo, lower alkyl or halo; and

R^2 is hydrogen or cyano;

or a pharmaceutically acceptable salt thereof.

3. A compound of the formula:



in which

R^1 is hydrogen, lower alkylamino, di(lower)alkylamino, cyano, halo, lower alkyl or halo; and

R^2 is hydrogen or cyano;

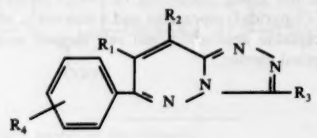
or a pharmaceutically acceptable salt thereof.

4,112,095
6-PHENYL-1,2,4-TRIAZOLO[4,3-b]PYRIDAZINE HYPOTENSIVE AGENTS

George Rodger Allen, Jr., Old Tappan, N.J.; John William Hanifin, Jr.; Daniel Bryan Moran, both of Suffern, and Jay Donald Albright, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

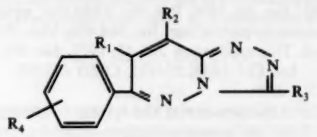
Continuation-in-part of Ser. No. 730,395, Oct. 7, 1976, abandoned. This application Jul. 29, 1977, Ser. No. 820,275
Int. Cl.[2] C07D *487/04;* A61K *31/50*
U.S. Cl. 424—250 17 Claims

1. A compound selected from the group consisting of those of the formula:



wherein R_1, R_2, and R_3 are each individually selected from the group consisting of hydrogen and alkyl having up to 3 carbon atoms and R_4 is fluoro, chloro, bromo, cyano, trifluoromethyl, nitro, amino, acetamido, carbamoyl, thiocarbamoyl or alkyl having up to 4 carbon atoms with the proviso that at least one of R_1 and R_2 is hydrogen; and the pharmacologically acceptable acid-addition salts thereof.

14. The method of lowering elevated blood pressure in a mammal which comprises administering internally to said mammal an effective amount of a compound selected from the group consisting of those of the formula:



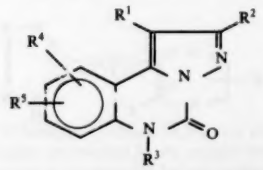
wherein R_1, R_2, and R_3 are each individually selected from the group consisting of hydrogen and alkyl having up to 3 carbon atoms and R_4 is fluoro, chloro, bromo, cyano, trifluoromethyl, nitro, amino, acetamido, carbamoyl, thiocarbamoyl or alkyl having up to 4 carbon atoms with the proviso that at least one of R_1 and R_2 is hydrogen; and the pharmacologically acceptable acid-addition salts thereof.

4,112,096
PYRAZOLO(1,5-c)QUINAZOLINE DERIVATIVES AND RELATED COMPOUNDS

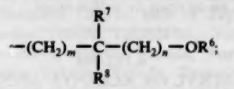
B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 702,364, Jul. 2, 1976, Pat. No. 4,076,818. This application Mar. 17, 1977, Ser. No. 778,397
Int. Cl.[2] C07D *487/04;* A61K *31/415, 31/505*
U.S. Cl. 424—251 9 Claims

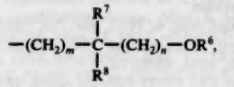
1. A compound of the structure



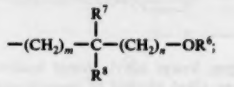
wherein R^1 and R^2 are the same or different, and R^1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl having a single substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, and trifluoromethyl, or



R^2 is selected from the group consisting of



hydrogen, lower alkyl, phenyl or phenyl having a single substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy and trifluoromethyl, with the proviso that at least one of R^1 and R^2 is



R^6 is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbons, mono-halophenyl, mono-lower alkoxyphenyl, phenylalkyl having 1 to 8 carbons in the alkyl group, phenyl, or phenyl having a mono-lower alkoxy substituent;

R^3 is selected from the group consisting of hydrogen, lower alkyl, benzyl, phenyl, phenyl having a single substituent selected from the group consisting of lower alkoxy, trifluoromethyl, benzyl, or benzyl having a single substituent selected from the group consisting of lower alkoxy, halogen or trifluoromethyl;

R^4 and R^5 are the same or different and are selected from the group consisting of hydrogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, lower alkanoyloxy of 1 to 4 carbons, nitro, benzyloxy, benzyloxy having a mono-lower alkoxy substituent, halogen, hydroxy, and trifluoromethyl;

R^7 and R^8 may be the same or different and are selected from the group consisting of hydrogen, alkyl having 1 to 3 carbons, phenyl, phenyl having a lower alkoxy substituent, benzyl, or benzyl having a mono-lower alkoxy substituent, or R^7 and R^8 taken together is a single cycloalkyl ring of 3 to 7 carbons;

$(CH_2)_m$ and $(CH_2)_n$ represent straight chain alkylene radicals, or mono- or di-alkyl substituted alkylene radicals wherein the alkyl group has 1 to 2 carbons, m and n are integers which may be the same or different and are 0 to 10, with the proviso that $m + n$ is $\leqq 10$, and where m is 0, $(CH_2)_m$ represents a single bond or where n is 0, $(CH_2)_n$ represents a single bond,

and physiologically acceptable salts thereof.

9. A method for treating allergic conditions in mammals, which comprises administering to the mammalian host a therapeutic amount of a compound as defined in claim 1.

4,112,097
ANTIHYPERTENSIVE AGENTS

Martin Winn, Deerfield; Jaroslav Kyncl, Lake Bluff; Daniel Ambrose Dunnigan, Winthrop Harbor, and Peter Hadley Jones, Lake Forest, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 621,980, Oct. 14, 1975, Pat. No. 4,026,894. This application Jan. 21, 1977, Ser. No. 760,895
Int. Cl.[2] A61K *31/505*
U.S. Cl. 424—251 7 Claims

1. A pharmaceutical composition useful as an antihypertensive comprising an active amount of a compound selected from

the class consisting of 2-[4-(tetrahydro-2-furoyl)-piperazino]-4-amino-6,7-dimethoxyquinazoline and 2-[4(tetrahydropyran-2-carbonyl)piperazinyl]-4-amino-6,7-dimethoxyquinazoline and pharmaceutically acceptable acid addition salts thereof and a pharmaceutically acceptacle carrier.

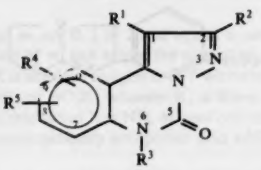
4,112,098

PYRAZOLO[1,5-C]QUINAZOLINE DERIVATIVES AND RELATED COMPOUNDS

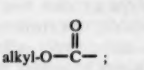
B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 17, 1977, Ser. No. 842,718
Int. Cl.[2] A61K *31/415, 31/505;* C07D *487/04*
U.S. Cl. 424—251 **19 Claims**

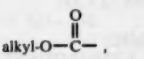
1. Compounds of the structure



wherein R^1 is hydrogen, alkyl of 1 to 3 carbons, 1-(hydroxyimino)alkyl, alkanoylamino, amino, or

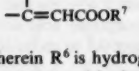


R^2 is 1-(hydroxyimino)alkyl, alkanoylamino, amino,



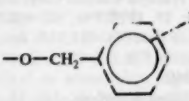
hydrogen, lower alkyl, phenyl or phenyl substituted by a single R^4, the alkyl moiety present in the above R^1 and R^2 groups having 1 to 8 carbons;

R^3 is hydrogen, lower alkyl having 1 to 8 carbons, benzyl, phenyl, phenyl substituted by a single R^4 radical, dialkylaminoalkyl having 1 to 8 carbons in each of the alkyl groups, mono-hydroxyalkyl,



(wherein R^6 is hydrogen or alkyl, and R^7 is alkyl of 1 to 4 carbons), with the proviso that R^1 or R^2 is 1-(hydroxyimino)alkyl, alkanoylamino, or amino, when R^3 is hydrogen, lower alkyl having 1 to 8 carbons, benzyl or phenyl;

R^4 and R^5 may be the same or different and are hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, hydroxy, alkanoyloxy of 2 to 5 carbons,



(wherein X_1 is hydrogen, lower alkoxy of 1 to 4 carbons), hydroxy, Cl, F, Br, CF_3 or NO_2,

and physiologically acceptable salts thereof.

19. A method for treating allergic conditions in mammals, which comprises administering to the mammalian host a therapeutic amount of a compound as defined in claim 1.

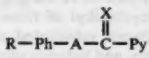
4,112,099

CYCLO ALIPHATIC-PHENYLENE-CARBONYL-PYRIDINES

Georges Haas, and Alberto Rossi, both of Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 443,289, Feb. 19, 1974, Pat. No. 3,980,657. This application Apr. 28, 1976, Ser. No. 680,947
Claims priority, application Switzerland, Feb. 19, 1973, 2381/73; Oct. 23, 1973, 14936/73
Int. Cl.[2] A61K *31/44;* C07D *213/50*
U.S. Cl. 424—263 **9 Claims**

1. Pyridine compounds of the general formula I



(I)

wherein R denotes a cycloalkenyl or cycloalkyl radical with 5 to 10 ring members which is unsubstituted or substituted by C_1–C_4-alkyl, C_2–C_4-alkenyl, C_1–C_4-alkoxy, hydroxy or oxo, 2- or 3-bicyclo[4,4,0]-decyl or -dec-2-enyl, 2-bicyclo[2,2,2]-octyl or -oct-2-enyl, 2-bornyl, 2-norbornyl, 2-bornenyl, 2-norbornenyl, 1-homoadamantyl, octahydro-1,2,4-methenopentalenyl which is unsubstituted or substituted by C_1–C_4-allyl or C_1–C_4-alkoxy, or 1- or 2-adamantyl, Ph denotes p-phenylene optionally substituted by nitro, trifluoromethyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine, fluorine or bromine, A denotes a direct bond, X denotes an oxo group, and Py denotes a pyridyl radical which is unsubstituted or C-substituted by C_1–C_4-alkyl or C_1–C_4-alkoxy, or a therapeutically acceptable acid addition salt thereof.

9. An antiinflammatory pharmaceutical preparation comprising an antiinflammatory effective amount of a compound claimed in claim 1 together with a conventional pharmaceutical excipient.

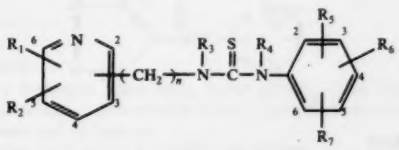
4,112,100

METHODS OF USE OF PYRIDYLALKYL PHENYLTHIOUREAS

William A. Callahan, Richland Township, Kalamazoo County; Eldridge Myles Glenn, Kalamazoo, and Douglas L. Rector, Parchment, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 428,373, Dec. 26, 1973, abandoned. This application Jun. 25, 1975, Ser. No. 590,273
Int. Cl.[2] A61K *31/44*
U.S. Cl. 424—263 **25 Claims**

1. A method for increasing the production of endogenous prostaglandins by a mammal which comprises administering to said mammal an effective amount of a compound of the formula:



a pyridyl N-oxide thereof and a pharmaceutically acceptable acid addtion salt thereof wherein R_1 and R_2 are each hydrogen, halogen, alkyl of one to six carbon atoms, inclusive, alkenyl of two to six carbon atoms, inclusive, cycloalkyl of three to six carbon atoms, inclusive, phenyl, alkoxy of one to 12 carbon atoms, inclusive, alkylthio of one to 12 carbon atoms, inclusive, nitro, amino, alkylamino with alkyl of one to 12 carbon atoms, inclusive, dialkylamino with each alkyl of one to 12 carbon atoms, inclusive, alkanoylamine with alkyl of one to 12 carbon atoms, inclusive, or trihalomethyl;

R_3 and R_4 are each hydrogen, alkyl of one to four carbon atoms, inclusive, cycloalkyl of three to eight carbon atoms, inclusive, aryl of six to 12 carbon atoms, inclusive,

aralkyl of seven to 12 carbon atoms, inclusive, and aryl of six to 12 carbon atoms, inclusive, said aryl substituted with halogen, alkoxy of one to four carbon atoms, inclusive, halogen substituted alkyl of one to four carbon atoms, inclusive, and halogen substituted alkoxy of one to four carbon atoms, inclusive; R_5 is hydrogen, halogen, alkyl of one to 12 carbon atoms, inclusive, alkenyl of two to 12 carbon atoms, inclusive, cycloalkyl of three to eight carbon atoms, inclusive, aryl of six to 12 carbon atoms, inclusive, aralkyl of seven to 12 carbon atoms, inclusive, alkoxy of one to 12 carbon atoms, inclusive, and halogen substituted alkyl of one to 12 carbon atoms, inclusive, halogen substituted alkenyl of two to 12 carbon atoms, inclusive, halogen substituted cycloalkyl of three to eight carbon atoms, inclusive, halogen substituted aryl of six to 12 carbon atoms, inclusive, and halogen substituted aralkyl of seven to 12 carbon atoms, inclusive; R_6 and R_7 are each nitro, amino, alkanoylamino with alkyl of one to 12 carbon atoms, inclusive, alkylamino with alkyl of one to 12 carbon atoms, inclusive, dialkylamino with each alkyl of one to 12 carbon atoms, inclusive, alkylthio with alkyl of one to 12 carbon atoms, inclusive, arylthio of six to 12 carbon atoms, inclusive, aryloxy of six to 12 carbon atoms, inclusive, and a group R_5 as previously defined; and *n* is an integer of from one to two, inclusive.

4,112,101
N-(PYRIDYL)-1H-(OR 2H) TETRAZOLE-5-CARBOXAMIDE DERIVATIVES FOR THE PREVENTION OF IMMEDIATE TYPE HYPERSENSITIVITY REACTIONS

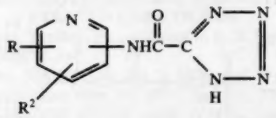
John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, both of Pa., and Albert J. Begany, Tucson, Ariz., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 669,562, Mar. 23, 1976, Pat. No. 4,044,144, which is a continuation-in-part of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, Mar. 23, 1973, abandoned. This application Jul. 15, 1977, Ser. No. 815,970

Int. Cl.[2] A61K *31/44;* **C07D** *401/02*

U.S. Cl. 424—263 **17 Claims**

1. A process for preventing the release of pharmacological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivities, food allergy and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:



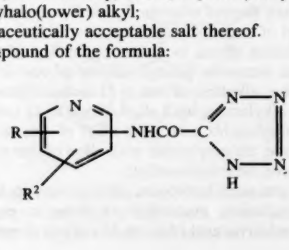
in which

R is —H or lower alkyl;

R^2 is —H, lower alkoxy, —CN, di(lower) alkylamino, halo or polyhalo(lower) alkyl;

or a pharmaceutically acceptable salt thereof.

3. A compound of the formula:



in which

R is —H or lower alkyl;

R^2 is —H, lower alkoxy, —CN, di(lower) alkylamino, halo or polyhalo(lower) alkyl;

or a pharmaceutically acceptable salt thereof.

4,112,102
HALOPYRIDYL DERIVATIVES OF M-AMINOTETRAMISOLE AS ANTHELMINTICS

John E. Thorpe, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

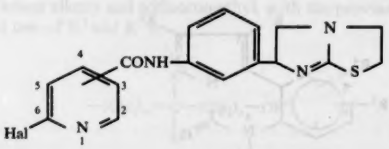
Filed Apr. 29, 1977, Ser. No. 792,142

Claims priority, application United Kingdom, May 1, 1976, 17883/76

Int. Cl.[2] A61K *31/44;* **C07D** *513/04*

U.S. Cl. 424—266 **8 Claims**

1. The dl- and l-forms of the compounds of the formula:



and the pharamceutically acceptable acid addition salts thereof,

wherein Hal is F, Cl, Br or I and the —CONH group is attached to the 3- or 4-position of the pyridine ring.

5. An anthelmintic composition useful for the treatment of helminth infections comprising an anthelmintic effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable diluent or carrier.

4,112,103
ANTIARRHYTHMIC (+,−)-CIS-α-[3-(2,6-DIMETHYL-1-PIPERIDINYL)-PROPYL]-α-PHENYL-2-PYRIDINEMETHANOLS

Robert Willerton Fleming, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Continuation-in-part of Ser. No. 676,964, Apr. 15, 1976, abandoned. This application Feb. 25, 1977, Ser. No. 772,203

Int. Cl.[2] C07D *213/38*

U.S. Cl. 424—267 **7 Claims**

1. (+,−)-cis-α-[3-(2,6-Dimethyl-1-piperidinyl)-propyl]-α-phenyl-2-pyridinemethanol and acid-addition salts thereof.

5. A method for controlling cardiac arrhythmia which comprises administering a compound of claim 1 wherein said acid-addition salts are pharmaceutically acceptable acid-addition salts to a mammal in a dose of from about 0.1 to about 10 mg. per kg. of body weight per day.

4,112,104
PHARMACOLOGICALLY ACTIVE COMPOUNDS

Graham John Durant, and Charon Robin Ganellin, both of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 640,525, Dec. 15, 1975, Pat. No. 4,025,527, which is a continuation-in-part of Ser. No. 481,716, Jun. 21, 1974, abandoned. This application Feb. 22, 1977, Ser. No. 770,340

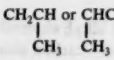
Claims priority, application United Kingdom, Jul. 13, 1973, 33428/73; Nov. 12, 1975, 46732/75

Int. Cl.[2] A61K *31/425, 31/42*

U.S. Cl. 424—270 **4 Claims**

1. A pharmaceutical composition to inhibit H-2 histamine receptors comprising a pharmaceutically acceptable oral or parenteral carrier and in an effective amount to inhibit said receptors a heterocyclic compound of the formula:

wherein Het_1 and Het_2, which may be the same or different, are thiazole or oxazole, which is optionally monosubstituted by lower alkyl having 1 to 4 carbon atoms, hydroxyl, halogen or amino; Z_1 and Z_2 are sulphur or a methylene group; B_1 is $(CH_2)_{n_1}$ and B_2 is $(CH_2)_{n_2}$ and when Z_1 is sulphur and m_1 is 1, B_1 may also be CH_2CHR, $CHRCH_2$, $CHRCH_2CH_2$, CH_2CHRCH_2 or CH_2CH_2CHR wherein R is methyl or ethyl or when Z_1 and Z_2 are sulphur and m_1 and m_2 are 1, both B_1 and B_2 may also be



m_1 and m_2 are 0, 1 or 2 and n_1 and n_2 are 2 or 3, provided that the sum of m_1 and n_1 and the sum of m_2 and n_2 are from 2 to 4; and X is sulphur, oxygen or NY wherein Y is hydrogen, cyano, $CONH_2$ or SO_2R_1 wherein R_1 is lower alkyl or phenyl, provided that when X is NH, at least one of Z_1 or Z_2 is sulphur, or a pharmaceutically acceptable acid addition salt thereof.

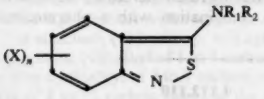
4,112,105

ANTI-INFLAMMATORY 3-(SUBSTITUTED-AMINO)-2,1-BENZISOTHIAZOLES

John Alan Carlson, Nassau, and Malcolm Rice Bell, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed May 4, 1977, Ser. No. 793,629
Int. Cl.[2] A61K *31/425;* **C07D** *275/04*
U.S. Cl. 424—270 **28 Claims**

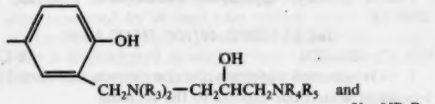
1. A compound having the formula



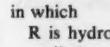
wherein:

R_1 is hydrogen, methyl or ethyl;

R_2 is selected from the group consisting of



and



or

R_1 and R_2 taken together with the nitrogen atom are piperazinyl, N-lower alkylpiperazinyl or N-phenylpiperazinyl;

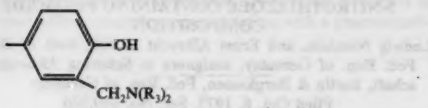
R_3 is methyl or ethyl;

R_4 and R_5 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, hydroxy-lower alkyl, or when taken together with the nitrogen atom, are pyrrolidino, piperidino, hexamethyleneimino, piperazinyl, N-lower alkylpiperazinyl or N-phenylpiperazinyl;

Y is an alkylene group containing from 2 to 8 carbon atoms and separating the two nitrogen atoms by at least 2 carbon atoms;

X occupies any of positions 4,5,6 or 7 and is selected from the group consisting of methoxy and halo; and

n is 1 or 2; or 0,1 or 2 when R_2 is



or an acid-addition salt thereof.

26. A method of reducing inflammation in a mammal in need of such treatment which comprises administering to said mammal an effective anti-inflammatory amount of a compound according to claim 1.

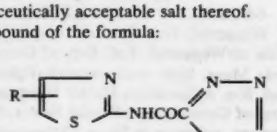
4,112,106

N-(2-THIAZOLYL)-TETRAZOLE-5-CARBOXAMIDE DERIVATIVES FOR THE PREVENTION OF IMMEDIATE TYPE HYPERSENSITIVITY REACTIONS

John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, both of Pa., and Albert J. Begany, Tucson, Ariz., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 669,562, Mar. 23, 1976, Pat. No. 4,044,144, which is a continuation-in-part of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, Mar. 23, 1973, abandoned. This application Jul. 15, 1977, Ser. No. 815,974
Int. Cl.[2] A61K *31/425;* **C07D** *417/02*
U.S. Cl. 424—270 **6 Claims**

1. A process for preventing the release of pharmacological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivitis, food allergy and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:

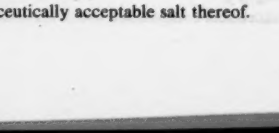


in which

R is hydrogen, lower alkyl, lower alkoxy, —CN, (lower) alkyl amino, di(lower) alkylamino, polyhalo(lower) alkyl, halo and carbamoyl;

or a pharmaceutically acceptable salt thereof.

2. A compound of the formula:



in which

R is hydrogen, lower alkyl, lower alkoxy, —CN, (lower) alkyl amino, di(lower) alkylamino, polyhalo(lower) alkyl, halo and carbamoyl;

or a pharmaceutically acceptable salt thereof.

4,112,107
5-NITROTHIAZOLE CONTAINING PESTICIDE COMPOSITION

Ludwig Nüsslein, and Ernst Albrecht Pieroh, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

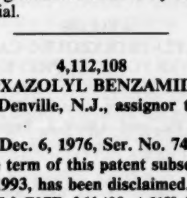
Filed Oct. 6, 1977, Ser. No. 840,006

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2646044

Int. Cl.[2] A01N *9/12, 9/20*

U.S. Cl. 424—270 **6 Claims**

1. A method of protecting plants against phytopathogenic earth fungi, nematodes, insects and acarides, the said method comprising applying to the plants or to the ground in which the plants are growing a composition comprising from 1 to 80% by weight of at least one compound of the formula



wherein Hal is halogen and 99 to 20% by weight of a liquid or solid carrier material.

4,112,108
ISOXAZOLYL BENZAMIDES

Jeffrey Nadelson, Denville, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

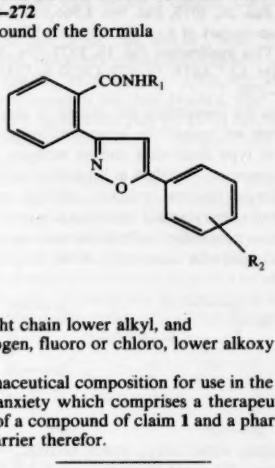
Filed Dec. 6, 1976, Ser. No. 747,772

The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.

Int. Cl.[2] C07D *261/08;* **A61K** *31/42*

U.S. Cl. 424—272 **7 Claims**

1. A compound of the formula



where

R_1 is straight chain lower alkyl, and

R_2 is hydrogen, fluoro or chloro, lower alkoxy or trifluoromethyl.

7. A pharmaceutical composition for use in the treatment of insomnia or anxiety which comprises a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier therefor.

4,112,109
4-SUBSTITUTED PYRAZOLES

Eike Möller, Wuppertal, Fed. Rep. of Germany; Karl Meng, deceased, late of Wuppertal, Fed. Rep. of Germany, by Ilse Heide Frieda Meng, legal representative; Egbert Wehinger, Neviges, Fed. Rep. of Germany; Harald Horstmann, Wuppertal, Fed. Rep. of Germany, and Friedel Seuter, Neviges, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

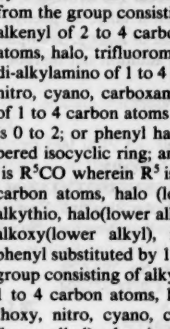
Division of Ser. No. 693,970, Jun. 8, 1976. This application Feb. 7, 1977, Ser. No. 766,187

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1975, 2526467

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 P **22 Claims**

1. A pharmaceutical composition useful for effecting diuresis and saluresis in humans and animals and for treating hypertension and thromboses in humans and animals which comprises a diuretically effective amount, a saluretically effective amount, an anti-hypertensively effective amount or an antithrombotically effective amount of a compound of the formula



wherein

R is hydrogen or lower alkyl;

R^1 is haloalkylthio of 1 to 4 carbon atoms in the alkyl moiety and 1 to 3 halo atoms;

R^2 is lower alkyl;

R^3 is aryl of 6 to 10 carbon atoms unsubstituted or substituted by 1 to 3 of the same or different substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, trifluoromethyl, trifluoromethoxy, mono- or di-alkylamino of 1 to 4 carbon atoms in each alkyl moiety, nitro, cyano, carboxamido, sulphonamido and SO_n-alkyl of 1 to 4 carbon atoms in the alkyl moiety and wherein *n* is 0 to 2; or phenyl having fused thereto a 5- to 7-membered isocyclic ring; and

R^4 is R^5CO wherein R^5 is lower alkyl, cycloalkyl of 5 to 7 carbon atoms, halo (lower alkyl), lower alkoxy, lower alkythio, halo(lower alkoxy), halo(lower alkythio), lower alkoxy(lower alkyl), mono- or di(lower alkylamino), phenyl substituted by 1 to 3 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, trifluoromethyl, trifluoromethoxy, nitro, cyano, carboxamido, sulphonamido, SO_n-(lower alkyl) wherein *n* is 0 to 2, and SO_n-CF_3 wherein *n* is 0 to 2 or phenyl having fused thereto a 5- to 7-membered isocyclic ring, in combination with a pharmaceutically acceptable carrier.

4,112,110
OXYGENATED AZATETRACYCLIC COMPOUNDS

Hans Blattner, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

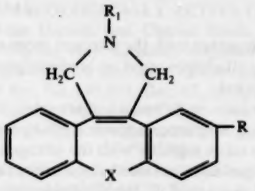
Continuation of Ser. No. 549,628, Feb. 13, 1975, abandoned. This application Nov. 3, 1976, Ser. No. 738,498

Claims priority, application Switzerland, Feb. 22, 1974, 2545/74

Int. Cl.[2] C07D *491/06;* **H61K** *31/40*

U.S. Cl. 424—274 **18 Claims**

1. 5-Oxygenated asatetracyclic compounds substituted in the 1-position which correspond to the formula



(I)

wherein X represents oxygen or sulphur, R represents a hydroxy group, and R_1 stands for lower alkyl, or acid addition salts thereof.

17. A pharmaceutical preparation for the treatment of tension and agitation which comprises a therapeutically effective amount of a compound of formula I according to claim 1 or a

pharmaceutically applicable acid addition salt thereof, together with a pharmaceuticaly usable carrier material.

4,112,111

INDOLINYLGUANIDINES

Gerhard Bormann, Munchenstein, and Richard Berthold, Bottmingen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

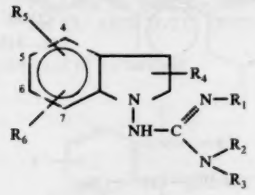
Continuation-in-part of Ser. No. 737,443, Nov. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 659,778, Feb. 20, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,243

Claims priority, application Switzerland, Feb. 26, 1975, 2440/75; Aug. 27, 1976, 10883/76

Int. Cl.[2] **A61K** *31/40;* **C07D** *209/08, 209/30, 209/04*

U.S. Cl. 424—274 **29 Claims**

1. A compound of formula I,

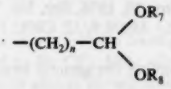


I

wherein

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, the phenyl ring being unsubstituted or mono- or di-substituted independently by halogen of atomic number of from 9 to 35, or alkyl or alkoxy of 1 to 4 carbon atoms,

R_2 is (i) hydrogen; (ii) alkyl of 1 to 4 carbon atoms; (iii) phenylalkyl of 7 to 9 carbon atoms, the phenyl ring being unsubstituted or mono- or di-substituted independently by halogen of atomic number of from 9 to 35, or alkyl or alkoxy of 1 to 4 carbon atoms; (iv) alkenyl or alkynyl of 3 to 5 carbon atoms, wherein the multiple bond is other than in the α,β position with respect to the nitrogen to which R_2 is attached; (v) hydroxy; (vi) cycloalkyl of 3 to 7 carbon atoms; (vii) alkyl of 1 to 4 carbon atoms monosubstituted by cycloalkyl of 3 to 7 carbon atoms; (viii) phenoxyalkyl of 8 to 11 carbon atoms in the aggregate thereof, the oxygen atom thereof being separated by at least two carbon atoms from the nitrogen atom to which R_2 is attached, the phenyl ring being unsubstituted or mono- or di-substituted independently by halogen of atomic number of from 9 to 35, or alkyl or alkoxy of 1 to 4 carbon atoms; (ix) aminoalkyl of 2 to 5 carbon atoms, the nitrogen thereof being separated by at least two carbon atoms from the nitrogen atom to which R_2 is attached, wherein the amino group is disubstituted by alkyl groups independently of 1 to 4 carbon atoms, or (x) an acetal group



wherein

n is a whole number from 1 to 5;

R_7 and R_8 are independently alkyl of 1 to 4 carbon atoms or together are an alkylene chain of 2 or 3 carbon atoms,

R_3 and R_4 independently are hydrogen, or alkyl of 1 to 4 carbon atoms, and

R_5 and R_6 independently are hydrogen, halogen of atomic number of from 9 to 35 or alkyl, alkoxy or alkylthio of 1 to 4 carbon atoms,

in free base form or in pharmaceutically acceptable acid addition salt form.

8. A composition for treating edema, hypertension, orthostatic disorders, or vascular headaches in animals comprising a compound of claim 1 in an amount effective for treatment of the above named conditions in association with a pharmaceutical carrier or diluent.

4,112,112

PYRROLO[2,1-b] [3]BENZAZEPINES USEFUL FOR PRODUCING A SKELETAL MUSCLE RELAXING OR TRANQUILIZING EFFECT

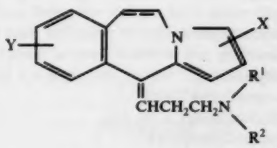
Clarence Stanley Rooney, Worcester, Pa.; Joshua Rokach, Laval, and Joseph George Atkinson, Montreal, both of Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 701,001, Jun. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 592,436, Jul. 2, 1975, abandoned. This application Jun. 6, 1977, Ser. No. 803,481

Int. Cl.[2] **C07D** *487/04;* **A61K** *31/40*

U.S. Cl. 424—274 **16 Claims**

1. A compound of structural formula:

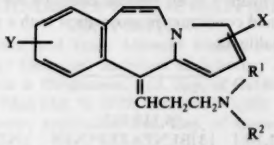


or pharmaceutically acceptable salt thereof, wherein the dotted line represents saturation or unsaturation; X and Y are independently selected from

(1) hydrogen
(2) halo,
(3) formyl,
(4) C_{2-6}-alkanoyl,
(5) C_{1-5}-alkyl,
(6) (C_{1-5}-alkoxy)carbonyl,
(7) hydroxy-C_{1-3}-alkyl,
(8) trifluoromethyl
(9) C_{1-3}-alkoxy
(10) cyano,
(11) trifluoromethylthio,
(12) C_{1-3}-alkylthio,
(13) C_{1-3}-alkylsulfonyl,
(14) trifluoromethylsulfonyl,
(15) C_{1-3}-alkylsulfinyl,
(16) trifluoromethylsulfinyl,
(17) amino,
(18) C_{2-6}-alkanoylamino,
(19) C_{1-3}-alkylamino,
(20) di(C_{1-3} alkyl)amino,
(21) hydroxy,
(22) N-C_{1-3}-alkylcarbamoyl,
(23) N,N-di(C_{1-3} alkyl)carbamoyl,
(24) nitro,
(25) di(C_{1-3} alkyl)sulfamoyl,
(26) C_{1-3} alkoxycarbonylamino, and
(27) N-C_{1-3} alkylcarbamoyloxy; and R^1 and R^2 are independently selected from
(1) hydrogen,
(2) C_{1-3}-alkyl,
(3) C_{2-5} alkenyl, and
(4) C_{3-6}-cycloalkyl, or

R^1 and R^2 joined together form with the nitrogen to which they are attached 1-piperidyl, 1-pyrrolidyl, or 4-morpholinyl.

9. A pharmaceutical composition for producing a skeletal muscle relaxing or tranquilizing effect comprising a pharmaceutical carrier and an effective amount of a compound of formula:



or pharmaceutically acceptable salt thereof wherein the dotted line represents saturation or unsaturation; X and Y are independently selected from

(1) hydrogen
(2) halo,
(3) formyl,
(4) C_{2-6}-alkanoyl,
(5) C_{1-5}-alkyl,
(6) (C_{1-5}-alkoxy)carbonyl,
(7) hydroxy-C_{1-3}alkyl,
(8) trifluoromethyl
(9) C_{1-3}-alkoxy,
(10) cyano,
(11) trifluoromethylthio,
(12) C_{1-3}-alkylthio,
(13) C_{1-3}-alkylsulfonyl,
(14) trifluoromethylsulfonyl,
(15) C_{1-3}-alkylsulfinyl,
(16) trifluoromethylsulfinyl,
(17) amino,
(18) C_{2-6}-alkanoylamino,
(19) C_{1-3}-alkylamino,
(20) di(C_{1-3}-alkyl)amino,
(21) hydroxy,
(22) N-C_{1-3}-alkylcarbamoyl,
(23) N,N-di(C_{1-3}-alkyl)carbamoyl,
(24) nitro,
(25) di(C_{1-3}-alkyl)sulfamoyl,
(26) C_{1-3}-alkoxycarbonylamino, and
(27) N-C_{1-3}-alkylcarbamoyloxy; and

R^1 and R^2 are independently selected from

(1) hydrogen,
(2) C_{1-3}-alkyl,
(3) C_{2-5}-alkenyl, and
(4) C_{3-6}-cycloalkyl, or

R^1 and R^2 joined together form with the nitrogen to which they are attached 1-piperidyl, 1-pyrrolidyl, or 4-morpholinyl.

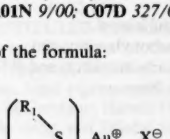
4,112,113

BIS(SULFIDE)GOLD(1+) SALTS

David T. Hill, North Wales, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 25, 1977, Ser. No. 772,034
Int. Cl.² A01N *9/00;* **C07D** *327/00, 333/00*
U.S. Cl. 424—275 **4 Claims**

1. A compound of the formula:



in which R_1 and R_2 taken together with the sulfur atom to which they are attached form a tetrahydrothienyl or tetrahydrothiapyranyl ring and X is a weakly nucleophilic anion selected from perchlorate, iodate, tetrafluoroborate or hexafluorophosphate.

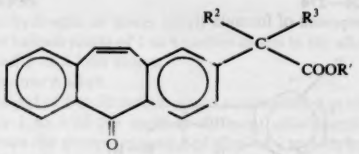
4,112,114

ESTERS OF 2-SUBSTITUTED-5-OXO-5H-DIBENZO[A,D]CYCLOHEPTENES HAVING PHARMACEUTICAL ACTIVITY, AND METHODS AND COMPOSITIONS FOR THE USE THEREOF

Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

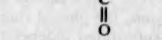
Division of Ser. No. 724,042, Sep. 16, 1976, abandoned, which is a division of Ser. No. 619,158, Oct. 3, 1975, abandoned. This application Sep. 2, 1977, Ser. No. 830,264
Int. Cl.² C07D *317/36*
U.S. Cl. 424—285 **4 Claims**

1. A compound selected from the group of compounds represented by the formula:



(I)

where R′ is



one of R^2 and R^3 is hydrogen and the other is methyl.

4,112,115

THERAPY OF LEG MUSCLE CRAMPS

Charles C. Coghlan, 3358-0 Monte Hermosa, Laguna Hills, Calif. 92653

Filed Nov. 8, 1976, Ser. No. 740,118
Int. Cl.² A61K *31/27*
U.S. Cl. 424—300 **10 Claims**

1. A method of alleviating spasms in flexor and extensor muscles comprising the step of topically administering to the surface of the skin adjacent said muscle a spasms alleviating amount of a solution of a nitrite vasodilator agent in a pharmacologically acceptable carrier.

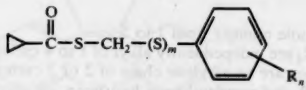
4,112,116

CERTAIN CYCLOPROPANE THIOLCARBOXYLATES AND USE THEREOF AS MITICIDES

Ferenc M. Pallos, Walnut Creek, CA, assignor to Stauffer Chemical Company, Westport, Conn.

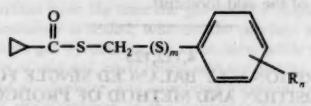
Filed Nov. 18, 1976, Ser. No. 742,803
Int. Cl.² A01N *9/12;* **C07C** *153/09*
U.S. Cl. 424—301 **26 Claims**

1. A compound having the general structural formula



wherein R is selected from the group consisting of halogen and lower alkyl having 1–4 carbon atoms; *m* is 0 or 1; and *n* is 0, 1, 2, or 3.

19. A method for controlling mites which comprises applying to the locus where control is desired a miticidally effective amount of a compound having the general structural formula



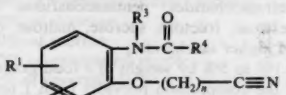
wherein R is selected from the group consisting of halogen and lower alkyl having 1–4 carbon atoms; *m* is 0 or 1; and *n* is 0, 1, 2, or 3.

4,112,117
ALPHA-CYANO-O-ANISIDINO DERIVATIVES

Paul L. Anderson, Dover, and Thomas F. Oglia, Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Oct. 26, 1976, Ser. No. 735,376
Int. Cl.[2] A61K *31/275;* **C07C** *121/78*
U.S. Cl. 424—304 **14 Claims**

1. A compound of the formula



wherein

R^1 is a hydrogen atom, halogen having an atomic weight of from about 18 to 36, CF_3, NO_2, alkyl having from 1 to 4 carbon atoms, or alkoxy having from 1 to 4 carbon atoms;

R^2 is a hydrogen atom, halogen having an atomic weight of from about 18 to 36, alkyl having from 1 to 4 carbon atoms or alkoxy having from 1 to 4 carbon atoms;

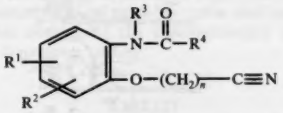
R^3 is a hydrogen atom or alkyl having from 1 to 3 carbon atoms;

R^4 is alkyl having from 1 to 6 carbon atoms; and

n is 1;

provided that when R^1 is any of CF_3, NO_2 or a branched alkyl or branched alkoxy, and R^2 is located on a carbon atom adjacent thereto, then R^2 is not a branched alkyl or branched alkoxy.

11. A method of reducing the blood level of lipid materials in a mammal, comprising administering to said mammal an amount of a compound of the formula



wherein

R^1 is a hydrogen atom, halogen having an atomic weight of from about 18 to 36, CF_3, NO_2, alkyl having from 1 to 4 carbon atoms, or alkoxy having from 1 to 4 carbon atoms;

R^2 is a hydrogen atom, halogen having an atomic weight of from about 18 to 36, alkyl having from 1 to 4 carbon atoms or alkoxy having from 1 to 4 carbon atoms;

R^3 is a hydrogen atom or alkyl having from 1 to 3 carbon atoms;

R^4 is alkyl having from 1 to 6 carbon atoms; and

n is 1 or 2;

provided that when R^1 is any of CF_3, NO_2 or a branched alkyl or branched alkoxy, and R^2 is located on a carbon atom adjacent thereto, then R^2 is not a branched alkyl or branched alkoxy; effective in reducing the blood level of lipid materials of said mammal.

4,112,118
PROCESS FOR PREPARING PHOSPHATE SALTS

Frank Michael Cussons, Cumbria; Douglas Edward Mather, Whitehaven, and Thomas Alan Williams, Beckermet, all of England, assignors to Albright & Wilson Ltd., West Midlands, England

Filed Jul. 29, 1976, Ser. No. 709,632
Claims priority, application United Kingdom, Aug. 5, 1975, 32642/75
Int. Cl.[2] C01B *15/16, 25/26*
U.S. Cl. 423—313 **20 Claims**

1. A process which comprises contacting a one phase solution of phosphoric acid and water in an organic water immiscible solvent with a base, which is ammonia or a basic compound of ammonia, sodium or potassium, the base being anhydrous or with water in an amount of up to 10 moles, to give a liquid phase mixture comprising an organic solvent phase substantially free of phosphoric acid and an aqueous phase comprising phosphoric acid and the dihydrogen phosphate salt of the base, the aqueous phase containing an atom ratio (M:P) in the range 0.1:1 to 0.5:1, wherein M is ammonia, sodium or potassium, and then separating the organic phase from said aqueous phase, the amount of base being the value which under the reaction conditions is at least sufficient to release substantially all the acid from the organic solvent solution and at most, x times that value, where x is governed by the relationship

$$x = \frac{b + 2c + d - 1}{b + 1.9c + d - 0.9}$$

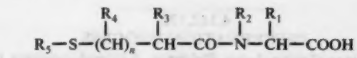
in which *b* is the number of moles of water associated with each mole of base added, *d* is the number of moles of water produced by the neutralization of one mole of phosphoric acid by an equivalent of base and *c* is the minimum number of moles of water per mole of phosphoric acid in an aqueous phosphoric acid solution in equilibrium with substantially acid free solvent at the aqueous reaction temperature.

4,112,119
METHOD FOR ALLEVIATING ANGIOTENSIN RELATED HYPERTENSION

Miguel Angel Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 684,606, May 10, 1976, Pat. No. 4,053,651. This application Mar. 3, 1977, Ser. No. 773,865
Int. Cl.[2] A61K *31/195*
U.S. Cl. 424—317 **7 Claims**

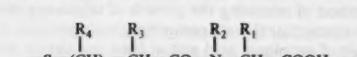
1. A method for alleviating angiotensin related hypertension in hypertensive mammals which comprises administering to said mammals an effective dose of an angiotensin converting enzyme inhibitor having the formula



or salt thereof, wherein

R_1 is amino-lower alkylene, mercapto-lower alkylene, lower alkylmercapto-lower alkylene or carboxy-lower alkylene;

R_2, R_3 and R_4 each is hydrogen, lower alkyl or phenyl-lower alkylene; R_5 is hydrogen, lower alkanoyl, benzoyl or



n is 0, 1 or 2.

4,112,120

METHODS AND COMPOSITIONS FOR USE IN ANIMAL HUSBANDRY

Michael James Smithers, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 16, 1976, Ser. No. 667,440

Claims priority, application United Kingdom, Apr. 17, 1975, 15854/75

Int. Cl.[2] A61K *31/175, 31/17, 31/155, 31/415*

U.S. Cl. 424—323 3 Claims

1. In the practice of the husbandry of meat-producing, domestic animals, the method for improving the rate of growth of animals or for improving the efficiency of the utilisation of animal foodstuffs which comprises orally administering to said animals a composition containing from 0.0001 to 0.025% w/w of a material selected from quinone derivatives of the formula:

I

wherein X is guanidinoimino, unsubstituted or bearing one substituent on nitrogen selected from C_{1-3}alkyl, and phenyl, unsubstituted or substituted by halogen; or 2-imidazolin-2-ylhydrazono; and Y is guanidinoimino, unsubstituted or substituted as defined above; 3-nitroguanidinoimino; semi-carbazono or thiosemicarbazono unsubstituted or substituted on N-4 by carbamoyl, benzyl, C_{1-3}alkyl or alkenyl, or phenyl; 3-[4-(guanidinoimino)cyclohexa-2,5-dienylideneimino]-guanidinoimino; 3-(4-semicarbazonocyclohexa-2,5-dienylideneimino)guanidinoimino; dihydro derivatives thereof; salts thereof; and salts of dihydro derivatives thereof, together with a liquid or solid, edible, non-toxic diluent or carrier.

4,112,121

METHOD AND COMPOSITION FOR THE TREATMENT OF SEBORRHEIC KERATOSIS

Louis T. Tenta, 6007 N. Sheridan Rd., Chicago, Ill. 60660

Continuation of Ser. No. 704,448, Jul. 12, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,392

The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/05*

U.S. Cl. 424—346 10 Claims

1. A chemexfoliation composition for the treatment of seborrheic keratosis consisting essentially of an alkali metal or ammonium phenate in an amount sufficient to provide a concentration of 4 to 20 weight % calculated as free phenol, a monohydric alcohol in an amount of from 25 to 85 weight %, a polyhydric alcohol humectant in an amount of from 5 to 35 weight %, and a pharmacologically acceptable, non-toxic gelling agent in an amount of from 5 to 15 weight %, said gelling agent providing a means for adhering the composition to the skin surface.

4,112,122

PRESERVATION PROCESS

Dennis James George Long, Brighton, England, assignor to BP Chemicals Limited, London, England

Filed May 4, 1977, Ser. No. 793,745

Claims priority, application United Kingdom, May 19, 1976, 20639/76; Nov. 29, 1976, 49608/76

Int. Cl.[2] A21D *2/14*

U.S. Cl. 426—19 7 Claims

1. A method of inhibiting the growth of micro-organisms in foodstuffs susceptible thereto comprising incorporating therein an acid salt of propionic acid and at least one cation selected from the group consisting of ammonium, sodium, potassium, calcium and magnesium such that the ratio of the acid to the cation in the salt is in the range of 2:1 to 4:1 on a chemical equivalent basis in an amount of between 0.01 and 1.0% by the dry weight of the said foodstuff.

4,112,123

NUTRITIONALLY BALANCED SINGLE FOOD COMPOSITION AND METHOD OF PRODUCTION

Willard Lewis Roberts, Mequom, Wis., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Jul. 21, 1976, Ser. No. 707,247

Int. Cl.[2] A23C *21/00*

U.S. Cl. 426—72 25 Claims

1. A single food nutritionally balanced composition for oral ingestion and producing low residues and diminished stooling for use with patients having abnormal catabolis states consisting essentially of:

(a) from 8% to 27% by weight of water soluble, undenatured ultra-filtration whey protein;

(b) from 5% to 20% by weight of medium chain triglycerides of predominantly 6 to 10 carbon atoms in the fatty acid chain;

(c) from 50% to 70% by weight of carbohydrates selected from the group consisting of corn syrup solids, trisaccharides, tetrasaccharides, pentasaccharides, hexasaccharides, dextrose, fructose, sucrose, maltose, oligosaccharides and higher saccharides;

(d) from 0.1% to 5% by weight of a food grade emulsifier; and wherein the composition provides from 1 up to about 3 calories per cubic centimeter of composition.

4,112,124

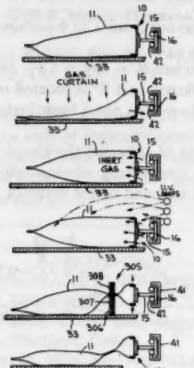
FOOD PACKAGING SYSTEM AND METHOD

Alexander S. Jarvis, Montreal, Canada, assignor to Drisan Packaging Ltd., Toronto, Canada

Filed Apr. 26, 1971, Ser. No. 137,553

Int. Cl.[2] B65B *55/16, 55/18*

U.S. Cl. 426—234 14 Claims



1. A method of packaging a food product in a substantially sterile condition comprising the steps of placing the substantially sterile product in a container which is sufficiently flexible as to be deformed by a current of gas, and which is opaque to visible light radiation, displacing any atmospheric air that is on the surface of the product with a dry, sterile, inert gas, sealing the container while said gas is substantially the only agent contacting the product and filling the container, and after the atmospheric air has been displaced irradiating the product with sterilizing ultraviolet lamp radiation while the gas is substantially the only agent contacting the surface of the product, the dosage of said ultraviolet radiation being sufficient to kill or render inert substantially all bacteria on the surface of the

product, and maintaining only said gas in contact with the product surface from the time the gas initially displaces the air until the container is sealed, wherein the product is contacted with the inert gas by placing the container, while open, in an atmosphere of said gas, performing said irradiating and sealing steps in said atmosphere, and supplying a current of gas to the exterior of the container as the container enters said atmosphere, said current of gas compressing the container to force some of the atmospheric air from the interior of the container.

4,112,125

SEMI-MOIST SHELF STABLE PARTICLE FOR CARRYING A FOOD COLOR AND FLAVOR

Jon C. Chesnut, Chicago, and Edward Epstein, Arlington Heights, both of Ill., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Feb. 15, 1977, Ser. No. 768,725
Int. Cl.[2] A23L *1/226, 1/275;* **A21D** *10/00*
U.S. Cl. 426—250 **25 Claims**

1. A semi-moist, semi-soft, shelf-stable and non-bleeding composition in the form of a particle for carrying a food flavor and color, comprising:

(1) 5 to 30% of vegetable or dairy protein;
(2) 0 to 50% of dextrose;
(3) 0 to 50% of sucrose;
(4) 5 to 70% of gelatinized starch;
(5) 5 to 40% of vegetable fat having an average melt temperature of 100° F. or less; and
(6) an effective amount of a color and flavor

but where at least one of the sucrose and dextrose is at least 5 % and the moisture content is between 5 and 30% and the water activity is 0.85 or less.

4,112,126

PROCESS FOR COUNTER-COLORING OF DECHARACTERIZED MEAT PRODUCTS

Ramon W. Nielsen, Simi Valley, Calif., and Craig C. Widmar, Amherst, Mass., assignors to Carnation Company, Los Angeles, Calif.

Filed Feb. 28, 1977, Ser. No. 772,466
Int. Cl.[2] A22C *17/10;* **A23K** *1/10*
U.S. Cl. 426—250 **11 Claims**

1. A process for treating inedible meat for use in animal foods which comprises

contacting said inedible meat with an amount of an approved FD&C denaturing color sufficient to decharacterize the meat, and

contacting the decharacterized meat with an amount of a counter-coloring agent sufficient to provide the meat with a substantially natural meat-like color, said counter-coloring agent comprising the complementary color of the FD&C denaturing color.

4,112,127

METHOD FOR PROCESSING AND FILLING A DOUGH PRODUCT

Samuel J. Popeil, Chicago, Ill., assignor to Popeil Brothers, Inc., Chicago, Ill.

Filed Jul. 9, 1976, Ser. No. 703,918
Int. Cl.[2] A21D *8/02*
U.S. Cl. 426—283 **2 Claims**

1. A method of processing dough comprising the steps of:

mixing the dough in a preselected quantity and kneading the same until a uniform consistency is achieved,

preforming the dough by providing an open ended blank cutter and filling it to overflow with dough,

thereafter passing the dough fill and blank cutter between a pair of opposed rollers to form a preformed blank having a compressed predetermined quantity and predetermined uniform configuration of dough,

removing the dough from the blank cutter,

feeding the preformed dough between the pair of opposed rollers which are in fixed rigid spaced relationship to each other thereby compressing the same,

reprocessing the dough by again passing the dough through the pair of opposed rollers until flat and dimensionally stable in the thickness dimension,

repositioning the rollers to a closer spacing,

reprocessing the dough again repeatedly between the rollers until flat and dimensionally stable in the thickness dimension,

positioning the flattened dough body on an open faced mold having upstanding cutting edges designed

to form the final food product,

repositioning the rollers to accommodate passing the open faced mold in cutting edge relationship,

passing the mold containing the dough through the repositioned rollers thereby severing the dough,

removing the thus formed dough product

whereby one set of rollers through repositioning the same are utilized to reprocess the dough until the desired thickness is obtained, and the same rollers pass the dough in cutting relationship when placed on an open faced mold, and dough products having various configurations with substantially flat surfaces are readily formed and can be further processed by baking, or drying.

4,112,128

PROCESS OF COLD STABILIZING WINE

Julius H. Fessler, 5455 Golden Gate Ave., Oakland, Calif. 94618

Filed Feb. 22, 1977, Ser. No. 770,852
Int. Cl.[2] C12G *1/00;* **C12H** *1/02, 1/10*
U.S. Cl. 426—330.4 **5 Claims**

1. A method for chemically treating wine to cold stabilize the wine at ambient temperature in less than 1 day's time, said wine to be chemically treated having a total acidity of tartaric acid and malic acid of less than about 1% of the wine, said method comprising the steps of;

(a) mixing a source of calcium ion and tartaric acid in an aqueous liquid to form a treating composition comprising a slurry including seed microcrystals of calcium tartrate, said calcium ion source being selected from the group consisting of calcium carbonate and calcium hydroxide, the ratio of calcium ion to tartaric acid in said treating composition being that formed from about 70 – 95 parts by weight calcium carbonate or an equivalent amount of calcium hydroxide; and about 5 – 30 parts by weight tartaric acid,

(b) mixing said treating composition with the wine to be treated under sufficient agitation to cause rolling of the wine,

(c) holding the wine at ambient temperature with periodic agitation to cause further rolling for a sufficient time to cold stabilize the wine by precipitating an amount of calcium tartrate approximately equivalent to that precipitated in the form of potassium acid tartrate during conventional low temperature cold stabilization, and

(d) removing precipitate from the wine, the major portion of said precipitate being calcium tartrate.

4,112,129

COOKING OIL TREATING SYSTEM AND COMPOSITION THEREFOR

Willard John Duensing, Lakewood, and Christian John Miga, Littleton, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Sep. 14, 1977, Ser. No. 833,215
Int. Cl.[2] A23D *5/02;* **C09F** *5/10*
U.S. Cl. 426—417 **8 Claims**

1. A composition useful for the control of free fatty acids and color in cooking oils, which consists essentially of, in parts by weight:

diatomite: 47 to 59 parts
synthetic calcium silicate hydrate: 28 to 36 parts

synthetic magnesium silicate hydrate: 12 to 24 parts wherein;

(a) said diatomite is a flux-calcined diatomite having a particle size distribution of approximately 20% to 30% less than 20 μm and 40% to 60% less than 30 μm with a dry bulk density of 10 to 14 lb/ft^3;

(b) said synthetic calcium silicate hydrate is formed by the hydrothermal reaction of calcium oxide and silica, having a $CaO:SiO_2$ weight ratio in the range of approximately 1:1.5 to 1:2.5, a dry bulk density of 6 to 10 lb/ft^3, a particle size distribution of at least about 95% −35 mesh and 8% +325 mesh and a permeability in the range of about 0.35 to 0.70 darcies; and

(c) said synthetic magnesium silicate hydrate is formed by the hydrothermal reaction of magnesium oxide and silica, with an $MgO:SiO_2$ weight ratio on the order of 1:3.5 to 1:5.5; a dry bulk density of about 12 to 15 lb/ft^3, particle size distribution of at least 95% −325 mesh, and a surface area of about 150 to 200 m^2/g.

4,112,130

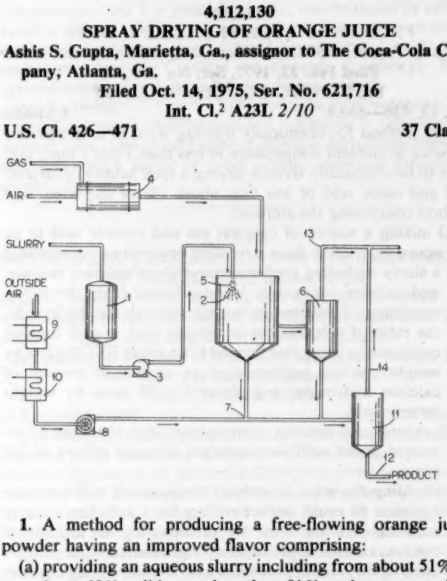
SPRAY DRYING OF ORANGE JUICE

Ashis S. Gupta, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Oct. 14, 1975, Ser. No. 621,716

Int. Cl.^{2} A23L *2/10*

U.S. Cl. 426—471 **37 Claims**



1. A method for producing a free-flowing orange juice powder having an improved flavor comprising:

(a) providing an aqueous slurry including from about 51% to about 65% solids, not less than 51% and not more than about 85% of the solids being orange juice solids with the balance consisting essentially of a food grade, water-dispersible or water-soluble drying aid and

(b) concurrently spray drying said slurry to a powder having a moisture content of less than about 4% in a spray drying apparatus having a drying chamber by passing said slurry through at least one high pressure spray nozzle, said spray drying being carried out at an inlet air temperature of about 220°–300° F, an outlet air temperature of about 145°–205° F and a nozzle pressure of from about 3,000 to about 5,000 psig, the interior walls of the drying chamber being maintained at a temperature of less than the sticky point temperature of the powder, the angle of spray drying and size of the drying chamber being selected in conjunction with the nozzle pressure to minimize any build up of undried orange juice powder on the walls of the drying chamber.

4,112,131

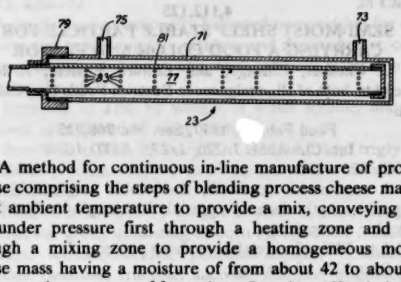
METHOD FOR MANUFACTURE OF PROCESS CHEESE

George Bosy, Park Ridge; Edwin N. Edwards, Glenview; Willis M. Hoffbeck, Palatine; Paul A. Silvio, Mount Prospect, all of Ill., and Leonard A. Warwick, Woburn, Mass., assignors to Kraft, Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 609,520, Sep. 2, 1975, abandoned. This application Feb. 9, 1977, Ser. No. 766,853

Int. Cl.^{2} A23C *19/00, 19/02*

U.S. Cl. 426—582 **3 Claims**



1. A method for continuous in-line manufacture of process cheese comprising the steps of blending process cheese materials at ambient temperature to provide a mix, conveying said mix under pressure first through a heating zone and then through a mixing zone to provide a homogeneous molten cheese mass having a moisture of from about 42 to about 75 percent under pressure of from about 5 to about 60 psig in said mixing zone at a temperature of from about 165° F. to about 300° F. and thereafter transferring said molten cheese mass from said mixing zone into a chamber maintained at a pressure lower than the pressure of said molten cheese mass in said mixing zone so as to cool said molten cheese mass to a temperature of from about 150° F. to about 210° F., said pressure in said chamber being from about 3 to about 15 psia with the proviso that the reduced pressure is at least 4 psi less than the pressure in said mixing zone, said heating zone comprising a steam injection conduit located within a housing to define an annular passage for flow of said mix, said mix passing between said conduit and said housing, said conduit having a plurality of steam injection holes spaced along its length for injection of steam into said mix during said flow to heat said mix to said temperature of from about 165° F. to about 300° F., while said mix flows through said annular passage, said holes having a diameter of from about 0.02 to about 0.07 inches, the thermodynamic balance between said mixing zone and said reduced pressure chamber being such that the moisture of said molten mass in said mixing zone is reduced by from about 2 to about 25 percent by weight based on the weight of the moisture present in said molten mass to provide a cooled cheese product having a moisture content of from about 40 to about 70 percent by weight.

4,112,132

BUTTER-LIKE FOOD PRODUCT

Ernest Badertscher, Orbe, and George Anthony Easton, Chardonne, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., La Tour de Peilz, Switzerland

Filed Jul. 30, 1976, Ser. No. 710,223

Claims priority, application Switzerland, Jul. 31, 1975, 9984/75

Int. Cl.^{2} A23D *3/02*

U.S. Cl. 426—603 **14 Claims**

1. A process for the production of an edible product of the butter or margarine type, which comprises thoroughly mixing, at a temperature in the range from about 20° C. to 35° C., a medium comprising fats, and an aqueous medium having a viscosity of from 2,000 to 20,000 centipoises, as measured at a temperature between 20° C. and 30° C., said mixing temperature being such that the fats exist in neither a partially crystallized state nor in a partially molten state, resulting directly in the formation of an emulsion of the water-in-oil type having a fat content of 35% to 90% which represents the edible product of the butter or margarine type.

4,112,133

LIQUID SMOKE COMPOSITION AND METHOD OF MAKING SAME

Ganta V. Rao; Floyd K. Shoup, both of Hutchinson, Kans., and Gerald R. Popenhagen, Sandusky, Ohio, assignors to Far-Mar-Co, Inc., Hutchinson, Kans.

Filed Sep. 29, 1976, Ser. No. 727,651
Int. Cl.[2] A23L *1/221*
U.S. Cl. 426—650 32 Claims

1. A method for making an improved liquid smoke composition comprising admixing:

(a) a natural liquid smoke solution, said solution including constituent acids, phenols and carbonyls therein;

(b) a food-grade acidulating agent in addition to the constituent acids in said natural liquid smoke solution; and

(c) a food-grade solubilizing agent selected from the group consisting of sorbitan fatty compounds, polyoxyethylene sorbitan fatty compounds, polyoxyethylene fatty compounds, polyoxyethylene glycols having molecular weights of at least 400, and mixtures thereof, said fatty compounds being selected from saturated and unsaturated mono-acids, saturated and unsaturated mono-alcohols, and mono-esters derived from any of the foregoing fatty compounds;

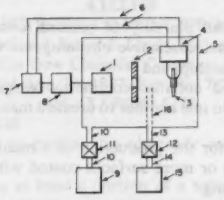
said acidulating agent comprising at least 2% by weight of said liquid smoke composition for a phenol concentration in said natural liquid smoke solution in the base range from 1500 to less than 2000 mg/l, plus 0.5% by weight for each 500 mg/l increment of phenol concentration above said phenol base range or minus 0.5% by weight for each 500 mg/l increment of phenol concentration below said phenol base range, said solubilizing agent comprising at least 4% by weight of said liquid smoke composition for a carbonyl concentration in said natural liquid smoke solution in the base range from 3000 to less than 3500 mg/l, plus 0.5% by weight for each 500 mg/l increment of carbonyl concentration above said carbonyl base range or minus 0.5% by weight for each 500 mg/l increment of carbonyl concentration below said carbonyl base range.

4,112,134

VACUUM DEPOSITION METHOD FOR FREQUENCY ADJUSTMENT OF PIEZOELECTRIC RESONATORS

Gabriel Ralph Buynak, Cleveland, and Franz Ludwig Sauerland, Shaker Heights, both of Ohio, assignors to Transat Corp., Shaker Heights, Ohio

Filed Mar. 22, 1976, Ser. No. 669,328
Int. Cl.[2] B05D *5/12*; C23C *13/04*
U.S. Cl. 427—10 2 Claims



1. Method for adjusting the resonant frequency FR of a piezo-electric resonator to a target frequency FT comprising:

(a) vapor depositing a material in a vacuum chamber for changing said resonant frequency of said resonator;

(b) monitoring said resonant frequency during the deposition process;

(c) continuing the deposition until |FR − FT| equals a predetermined value and then injecting an inert gas into the vacuum chamber to terminate the deposition.

4,112,135

METHOD FOR DIP-COATING CERAMIC WITH MOLTEN SILICON

Joseph D. Heaps, Shakopee, and Obert N. Tufte, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 625,443, Oct. 24, 1975, abandoned.
This application Dec. 9, 1976, Ser. No. 748,982
Int. Cl.[2] B05D *1/36, 5/12, 1/00, 7/24*
U.S. Cl. 427—11 26 Claims

1. A method for coating ceramic materials which are not wet by molten silicon with a uniform layer of silicon comprising the steps of:

providing a substrate of ceramic of a type which is not wet by molten silicon and having a thermal expansion coefficient similar to that of silicon;

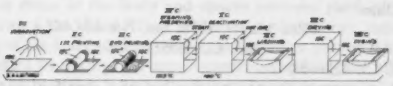
carbonizing the surface of the ceramic substrate; and contacting the carbonized ceramic substrate with molten silicon, to form a silicon coating on the carbonized ceramic surface.

4,112,136

METHOD OF MAKING A PATTERN-DYED, PATTERN-TEXTURES, OR LACE LIKE TEXTILE OR FOIL

Adolf Heger, Dresden; Gerrit Möckel, Zwickau; Helmar Pässler, Dresden; Jochen Pohlink, Falkenstein, and Werner Wünsch, Rodewisch, all of Germany, assignors to VEB Plauener Gardine, Plauen, Germany

Filed Dec. 23, 1975, Ser. No. 539,185
Claims priority, application German Democratic Rep., Jan. 7, 1974, 175859
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—36 7 Claims



1. A method of making a uniformly dyed, texture patterned textile web having a lace effect comprising the steps of:

uniformly irradiating the entire surface of said web with energy-carrying radiation corresponding to at least 3×10^6 rad electron beam energy for activating said web;

applying to said web in a predetermined lace-effect pattern and over less than all of the surface of said web an associatively-reactable compound;

forming a high-molecular association between said compound and the irradiated web to contour-pattern the surface thereof with a lace effect;

deactivating said web by exposure of the web having said contour pattern to steam, hot air or infrared heat at a temperature of 150° C; and

thereafter dyeing the deactivated contour pattern web.

4,112,137

PROCESS FOR COATING INSULATING SUBSTRATES BY REACTIVE ION PLATING

Bogdan Zega, Geneva, Switzerland, assignor to Battelle Memorial Institute, Carouge-Geneva, Switzerland

Filed Nov. 15, 1976, Ser. No. 741,783
Claims priority, application Switzerland, Nov. 19, 1975, 15019/75
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—38 14 Claims

1. A process for coating an insulating substrate with an oxide of at least one metal by reactive-ion plating, comprising the steps of:

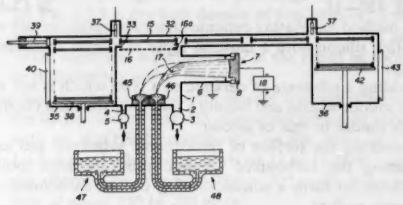
disposing a source of a vaporizable metallic mass in a sealed enclosure;

maintaining in said enclosure a rarefied oxygen atmosphere at a pressure capable of sustaining a glow dishcarge;

training at least one electron beam upon said source to vaporize said metallic mass;

disposing a substrate to be coated in said enclosure at a location spaced from the origin of said electron beam and remote from said source;

interposing a conductive grid within said enclosure between



said location and said source in proximity to said substrate; and

negatively biasing said grid with reference to said source with a voltage sufficient to develop a glow discharge therebetween for ionizing, jointly with said beam, part of the metal vapors emitted by said source and part of the oxygen of said atmosphere with acceleration of the interacting metal-vapor and oxygen ions toward said substrate to deposit thereon a resulting oxide.

4,112,138

MANIFOLD CARBONLESS FORM AND PROCESS FOR THE PRODUCTION THEREOF

Gerald Titus Davis, and Dale Richard Shackle, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed May 7, 1976, Ser. No. 684,461
Int. Cl.[2] B05D *3/08*
U.S. Cl. 427—54 **22 Claims**

1. A process for the production of a manifold carbonless form having two or more surfaces coated with chromogenic material comprising:

(a) providing a continuous web said continuous web having a first and second surface;

(b) marking said second surface of said continuous web with a pattern;

(c) applying a first non-aqueous, solvent-free coating of a first chromogenic material to at least a portion of said first surface of said continuous web said first non-aqueous, solvent-free coating comprising said first chromogenic material dispersed in a hot melt suspending medium, said coating being heated to a temperature above the melting point of said hot melt suspending medium to permit fluid application of said first coating composition to said first surface;

(d) setting said first coating by means of temperature decrease to form a marked, coated continuous web;

(e) combining said printed, coated continuous web with at least one additional continuous web to form a plurality of continuous webs,

(i) each of said additional continuous webs having a first and second surface,

(ii) each of said additional continuous webs being characterized by having at least a portion of the second surface thereof coated with a second chromogenic material, said second chromogenic material being coreactive with said first chromogenic material to form a color,

(iii) all except one of said additional continuous webs being further characterized by at least a portion of the first surface thereof being coated with at least one non-aqueous, solvent-free coating of said first chromogenic material, said non-aqueous, solvent-free coating on said first surface of all except one of said additional continuous webs comprising said first chromogenic material dispersed in a hot melt suspending medium,

(iv) said coating on said first surface of all except one of said additional continuous webs being heated to a temperature above the melting point of said hot melt suspending medium to permit fluid application thereof,

(f) setting said coating on said first surface on all except one of said additional continuous webs by means of temperature decrease;

(g) collating said plurality of printed, coated continuous webs such that coreactive chromogenic materials are in facing relationship; and

(h) placing said collated continuous webs in contiguous relationship to one another to create a manifold carbonless form.

10. (amended). A process for the production of a manifold carbonless form having two or more surfaces coated with chromogenic material comprising:

(a) providing a continuous web said continuous web having a first and second surface;

(b) marking said second surface of said continuous web with a pattern;

(c) applying a first non-aqueous, solvent-free coating of a first chromogenic material to at least a portion of said first surface of said continuous web said first non-aqueous, solvent-free coating comprising said first chromogenic material dispersed in a radiation curable material said first coating being applied to said first surface in fluid form;

(d) setting said first coating by means of exposure to radiation to form a marked, coated continuous web;

(e) combining said printed, coated continuous web with at least one additional continuous web to form a plurality of continuous webs,

(i) each of said additional continuous webs having a first and second surface,

(ii) each of said additional continuous webs being characterized by having at least a portion of the second surface thereof coated with a second chromogenic material, said second chromogenic material being coreactive with said first chromogenic material to form a color

(iii) all except one of said additional continuous webs being further characterized by at least a portion of the first surface thereof being coated with at least one non-aqueous, solvent-free coating of said first chromogenic material, said non-aqueous, solvent-free coating on said first surface of all except one of said additional continuous webs comprising said first chromogenic material dispersed in a radiation curable material,

(iv) said coating on said first surface of all except one of said additional continuous webs being applied in fluid form,

(f) setting said coating on said first surface on all except one of said additional continuous webs by means of exposure to radiation;

(g) collating said plurality of printed, coated continuous webs such that coreactive chromogenic materials are in facing relationship; and

(h) placing said collated continuous webs in contiguous relationship to one another to create a manifold carbonless form.

19. A process for the production of a manifold carbonless form having two or more surfaces coated with chromogenic material comprising:

(a) providing a continuous paper substrate, said continuous paper substrate having a front and back surface;

(b) applying a printing ink to said front surface of said continuous paper substrate, said printing ink being applied in a pattern corresponding to a printed image;

(c) applying a first non-aqueous, solvent-free coating of a capsular first chromogenic material onto said back surface of said continuous paper substrate said first non-aqueous, solvent-free coating comprising said encapsulated first chromogenic material dispersed in a hot melt suspending

medium, said first coating being heated to a temperature above the melting point of said hot melt suspending medium to permit fluid application of said first coating composition to said back surface;

(d) setting said first coating by means of temperature decrease to form a printed, coated continuous paper substrate;

(e) combining said printed, coated continuous paper substrate with from about 1 to about 5 additional continuous paper substrates to form a plurality of paper substrates having a front and a back surface, a second non-aqueous, solvent-free coating of a second chromogenic material being applied to said front surface of at least one of said additional continuous paper substrates, said second non-aqueous, solvent-free coating comprising said second chromogenic material dispersed in a radiation curable material, said second coating being applied in fluid form to said front surface, said second chromogenic material being reactive with said first chromogenic material to form a color;

(f) setting said second non-aqueous, solvent-free coating by means of exposure to radiation;

(g) collating said plurality of continuous paper substrates such that said first and second chromogenic materials are in facing relationship to a coreactive chromogenic material;

(h) placing said collated paper substrates in contiguous relationship to one another to create a manifold form; and

(i) finishing said manifold form.

4,112,139

PROCESS FOR RENDERING KAPTON OR OTHER POLYIMIDE FILM PHOTO SENSITIVE TO CATALYST FOR THE DEPOSITION OF VARIOUS METALS IN PATTERN THEREON

Albert Shirk, Palmyra, and John Peter Redmond, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 485,410, Jul. 3, 1974, abandoned. This application Sep. 20, 1976, Ser. No. 724,809

Int. Cl.[2] C23C *3/02*

U.S. Cl. 427—54 **12 Claims**

1. A method for forming patterns on a polyimide film substrate comprising the steps of: immersing said polyimide in a hydrazine-alkali metal hydroxide solution; exposing selected areas of the thus treated polyimide substrate to a desensitizing means in the form of ultraviolet light of 2537 A; immersing said substrate in a solution of a catalytic material of palladium salts and hydrochloric acid; and depositing unreduced catalyst material on nondesensitized areas of said substrate.

4,112,140

ELECTRODE COATING PROCESS

Henrik R. Heikel, and James J. Leddy, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 14, 1977, Ser. No. 787,418

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—126 **29 Claims**

1. A method to produce an electrode comprising sequentially:

(a) contacting at least a portion of a valve metal substrate with a first solution containing, as a solute, ruthenium in an amount of from about 1 to about 50 milligrams per milliliter of the first solution and a valve metal in an amount of from about 1 to about 50 milligrams per milliliter of the first solution, the weight ratio of the valve metal to ruthenium being about 1:4 to about 2:1, at least one solvent suitable to dissolve the ruthenium and valve metal values; and a sufficient amount of an acid to maintain the solute in solution;

(b) heating at least a portion of the contacted surface sufficiently to form a coating containing oxides of ruthenium and the valve metal on the substrate;

(c) contacting at least a portion of the oxide coated surface with a second solution containing, as a solute, ruthenium in an amount of from about 1 to about 25 milligrams per milliliter of the second solution and a valve metal in an amount of from about 4 to about 100 milligrams per milliliter of the second solution, the weight ratio of the valve metal to ruthenium being from about 20:1 to about 2:1 and greater than the valve metal to ruthenium ratio of the first solution; at least one solvent suitable to dissolve the ruthenium and valve metal values; and a sufficient amount of an acid to maintain the solute in solution;

(d) heating at least a portion of the contacted surface sufficiently to form a coating containing the oxides of ruthenium and the valve metal on the substrate.

4,112,141

METHOD OF USING FILLING SOLDER FOR AUTOMOBILE BODY

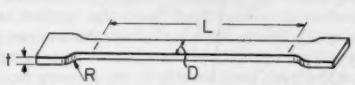
Eiichi Yoshida, Utsunomiya; Hideo Nakao, Shimo-tsuga; Norimasa Goto, Utsunomiya; Toul Sugiyama, Kaminokawa, and Sadao Kashiwaya, Mibu, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Apr. 22, 1977, Ser. No. 789,861

Claims priority, application Japan, May 6, 1976, 51-51477

Int. Cl.[2] C22C *11/00*

U.S. Cl. 427—142 **1 Claim**



1. In a method of smoothing a body of an automobile by filling in dents in the body and spaces between parts of the body with a lead-base filling solder as a preparatory step to coating of the body surface with enamel paint or varnish which is hardened by baking, the improvement comprising the use of a solder alloy which is a binary alloy and consists essentially of 2.0–7.0 Wt.% antimony, and the balance of lead as said filling solder.

4,112,142

METHOD FOR THE PRODUCTION OF LIGHT-REFLECTING LAYERS ON A SURFACE OF A TRANSPARENT GLASS ARTICLE

Hubert Schroder, Wiesbaden, and Werner Klein, Geisenheim, both of Germany, assignors to Glaswerk Schott & Gen., Germany

Continuation-in-part of Ser. No. 77,964, Oct. 5, 1970, abandoned. This application Aug. 21, 1972, Ser. No. 282,568

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1969, 1950854

Int. Cl.[2] B05D *1/38, 5/06, 1/02, 1/18*

U.S. Cl. 427—166 **7 Claims**

1. A method of making a reflecting plate having a non-reflecting surface comprising the the steps of simultaneously coating both surfaces of light permeable glass plate by sequentially

(A) immersing said glass plate in an organic mixed solution containing decomposible Ti and Si compounds in an amount of equal parts by weight per unit of volume calculated as TiO_2 and SiO_2, withdrawing said plate from said solution and drying said plate,

(B) immersing the resulting glass plate in a solution of an organic titanium compound decomposible into TiO_2, withdrawing said resulting plate from said solution and drying said resulting plate,

(C) immersing the so-coated plate in a solution of organic silicon compound decomposible into SiO_2, withdrawing the resulting plate from said solution, and drying it

(D) heating the product plate to a temperature ranging from 400° to 480° to produce a hardened, anti-reflection coating which shows a reflectance curve in the visible spectral range having at least two minima,

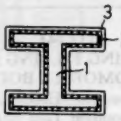
(E) and coating only the surface whose degree of reflection is to be increased with a reflection increasing coating.

4,112,143

METHOD OF MANUFACTURING AN OBJECT OF SILICON NITRIDE

Jan Adlerborn, and Hans Larker, both of Robertsfors, Sweden, assignors to ASEA Aktiebolag, Sweden

Filed Jan. 18, 1977, Ser. No. 760,463
Int. Cl.² C04B *33/34*
U.S. Cl. 427—191 **8 Claims**



1. Method of manufacturing an object of silicon nitride by isostatic pressing of a preformed body of silicon nitride powder with a pressure medium at a temperature required for sintering the silicon nitride, the preformed body then being subjected to a degassing before the isostatic pressing, characterised in that on the preformed powder body there are applied an inner porous layer of a first material and outside this an outer porous layer of a second material, the inner porous layer being transformable into a layer, impermeable for the pressure medium, at a temperature below the sintering temperature for the silicon nitride and the outer porous layer being transformable into a layer, impermeable for the pressure medium, at a temperature which is lower than that for the inner porous layer, whereafter the preformed body is first subjected to a degassing and to a heating to a temperature which is required for the formation of a layer, impermeable for the pressure medium, of the outer porous layer but which maintains the inner porous layer porous, and then to a heating to a temperature which is required for the formation of a layer, impermeable for the pressure medium, of the inner porous layer while maintaining a pressure outside said layers which is greater than the gas pressure inside these layers, the isostatic pressing of the preformed product then being carried out.

4,112,144

SURFACE TREATMENT OF FIBROUS SUBSTANCES

Michael W. Ellis, 1208 W. Mountain, Ft. Collins, Colo. 80521

Filed Jul. 6, 1976, Ser. No. 702,510
Int. Cl.² B05D *3/08*
U.S. Cl. 427—223 **12 Claims**

1. For use in the treatment of a significantly rough surface of porous wood to effect a weathered appearance of said surface, a compound having the composition, by volume, of:

between approximately one-half and one part of an oil-type carrier;

between approximately one-half and one part of rotten stone;

and approximately one part of wax.

8. A method of treating a significantly rough surface of a porous wood to effect a weathered appearance of said surface, comprising the steps of:

subjecting said surface to a blackening procedure;

applying to said subjected surface a compound having the composition, by volume, of between approximately one-half and one part of an oil-type carrier, between approximately one-half and one part of rotten stone, and approximately one part of wax;

drying said compound applied to said surface;

and thereafter buffing said surface sufficiently to develop highlights therein.

4,112,145

METHOD OF MANUFACTURING A LINING LAYER

Leandro Cisterni, Forli, Italy, assignor to S.U.B. Societa Utilizzazione Brevetti S.r.l., Forli, Italy

Filed Sep. 2, 1975, Ser. No. 609,720
Claims priority, application Italy, Sep. 9, 1974, 12026 A/74; Sep. 9, 1974, 12027 A/74; Sep. 23, 1974, 12030 A/74
Int. Cl.² B44C *1/20, 1/24*
U.S. Cl. 427—274 **17 Claims**

1. A method for producing a dried, layered material for a lining or coating comprising forming a paste mixture consisting essentially of from between about 20% to 30%, by weight, acetone; from between about 10% to 15% by weight, toluene, from between about 3% to 5% by weight, lubricating oil; from between about 10% to 15% by weight, vinyl glue; from between about 25% to 30% by weight, powder wood; and from between about 10% to 20%, by weight of an inert filler; converting said mixture to a layer having a thickness of from between about 2/10 of a millimeter to a few millimeters; and drying the said layer by evaporating said acetone and toluene.

4,112,146

POLYESTER RESIN COMPOSITIONS WHICH ARE PHOTOCURABLE IN THE PRESENCE OF OXYGEN AND AN ORGANIC HYDRAZONE POLYMERIZATION INITIATOR

Nelson R. Lazear, Piscataway, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 641,067, Dec. 15, 1975, abandoned. This application May 25, 1977, Ser. No. 800,477
Int. Cl.² C08F *8/00, 8/18, 8/34*
U.S. Cl. 427—54 **26 Claims**

1. An air-uninhibited polyester resin composition which is room temperature curable as a substantially 100 percent solids system without the incorporation of additional ingredients by exposure of the polyester resin composition to the action of oxygen and light, wherein said polyester resin composition comprises a prepolymer component (A) which contains between 2 and about 10 maleate and/or fumarate groups, and between 1 and about 5 allyl ether groups, and has a molecular weight between about 500 and 3000; a solvent component (B) which is a polymerizable acrylic or methacrylic acid ester derivative which is a liquid at 25° C and has a molecular weight of at least about 100; and an organic hydrazone polymerization initiator component (C) which is photosensitive in the presence of oxygen, corresponding to the formula:

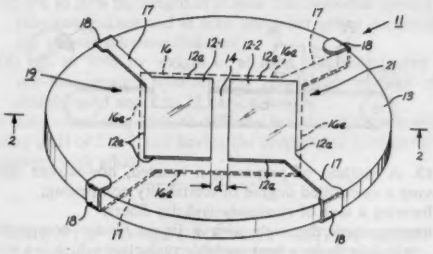
$$R-\overset{R^1}{\underset{|}{C}}=N-NH-R^2$$

where R is selected from the group consisting of hydrogen and aliphatic, alicyclic and aromatic hydrocarbon radicals containing between 1 and about 12 carbon atoms; R^1 is selected from aliphatic, alicyclic and aromatic hydrocarbon radicals containing between 1 and about 12 carbon atoms; R^2 is selected from aliphatic and alicyclic hydrocarbon radicals containing between 1 and about 6 carbon atoms; and R and R^1 taken together can be an alicyclic hydrocarbon radical.

4,112,147
METHOD OF MANUFACTURING A MONOLITHIC CRYSTAL FILTER

Edwin C. Thompson, West Epping, N.H., assignor to Western Electric Company, Inc., New York, N.Y.

Filed May 13, 1977, Ser. No. 796,625
Int. Cl.[2] H03H *3/02, 3/04*
U.S. Cl. 427—100 10 Claims



1. The method of manufacturing a monolithic crystal filter, which comprises the sequential steps of:

plating electrode material onto opposite sides of a crystal wafer to form a pair of split electrodes on one side of the wafer and a solid electrode on the other side of the wafer in superimposed relationship, to produce a device having an initial resonator coupling greater than a desired resonator coupling and having an initial midband frequency above a desired midband frequency;

plating additional electrode material onto the pair of split electrodes to narrow the initial resonator coupling of the device to a desired resonator coupling and to decrease the frequency of the device from the initial midband frequency to an intermediate midband frequency which is below the initial midband frequency and above the desired midband frequency; and

plating additional electrode material onto the solid electrode to decrease the midband frequency of the device from the intermediate midband frequency to the desired midband frequency.

4,112,148
METHOD OF CO-DEPOSIT COATING ALUMINUM OXIDE AND TITANIUM OXIDE

Frank Fonzi, Cedar Hill, Tex., assignor to Materials Technology Corporation, Dallas, Tex.

Division of Ser. No. 712,481, Aug. 9, 1976, Pat. No. 4,052,530. This application May 26, 1977, Ser. No. 800,630
Int. Cl.[2] C23C *11/08*
U.S. Cl. 427—248 C 5 Claims

1. The method of forming an adherent co-deposit of hexagonal alpha titanium oxide Ti_2O_3 and alpha alumina Al_2O_3 on a wear surface comprising the steps of

(a) maintaining said surface at a temperature between about 900° and 1250° C, and

(b) contacting said surface with a gaseous reactant stream containing an aluminum halide, water vapor and a titanium halide.

4,112,149
CONVERTING A DIAPHRAGM ELECTROLYTIC CELL TO A MEMBRANE ELECTROLYTIC CELL

Andrew D. Babinsky, Chagrin Falls, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

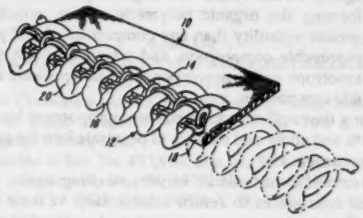
Continuation-in-part of Ser. No. 688,842, May 21, 1976, Pat. No. 4,036,728. This application Apr. 25, 1977, Ser. No. 790,756
Int. Cl.[2] C25B *11/03, 13/08*
U.S. Cl. 427—34 5 Claims

1. A method for forming a membrane over a standard diaphragm cell foraminous electrode comprising the steps of: suspending a matting material in a fluid medium; inserting a foraminous electrode into the suspension; vacuum forming a layer of the suspended matting material over the surface of the foraminous electrode so as to substantially reduce the porosity of the foraminous electrode material; applying to the surface of the foraminous electrode with the matting material thereon, a layer of thermoplastic material including material containing carboxyl ion exchange groups and baking the foraminous electrode with the layers in place until the thermoplastic material is fused into a thin and uniform film on the surface of the matting material which is substantially impermeable to hydraulic flow.

4,112,150
WATERPROOF SLIDE FASTENER

Michael A. Brown, 2909 Edgemoor La., Moraine, Ohio 45439, and Steven F. Shade, 1000 Lookout Ter., Apt. C, West Carrollton, Ohio 45449

Division of Ser. No. 425,888, Dec. 18, 1973, Pat. No. 3,914,827. This application Oct. 16, 1975, Ser. No. 623,040
Int. Cl.[2] B05D *5/00*
U.S. Cl. 427—284 9 Claims



1. A process for making a waterproof slide fastener device which includes a tape portion one edge of which mounts connector means formed to achieve an interdigiting connected relation to related connector means on a similar tape portion comprising the steps of providing a tape portion at one edge thereof with connector means in the form of projected segments having a loop-like configuration, moving a flow of liquid sealing material past said loop-like segments and to envelope said loop-like segments to web the said loop-like segments where said segments are connected to the tape, providing thereby that on interdigiting connector means of a pair of tape portions so provided, in a side by side arrangement, said sealing material will produce a complete seal across said tape portions in the area of said loop-like segments by means of the webs thereof.

4,112,151
IMPREGNATING POROUS ARTICLES

Theodore M. Cooke, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jan. 9, 1976, Ser. No. 647,836
Int. Cl.[2] B05D *3/00, 3/12*
U.S. Cl. 427—322 11 Claims

1. A method of forming a resilient microporous article, having a pressure expressible compositon contained in the micropores thereof, which comprises

(a) contacting a resilient microporous article, containing interconnecting micropores, said article having a matrix comprising a solvent swelling agent swellable resilient organic polymeric material with a mixture comprising:

(1) a pressure expressible composition and

(2) a volatile solvent swelling agent, which swells the organic polymeric material forming the matrix, which has a greater volatility than any component of said pressure expressible composition, and which does not form an azeotrope with any component of said pressure expressible composition

for a time sufficient to swell the polymeric matrix, enlarge the micropores, and allow said mixture to penetrate into the microporous article and

(b) removing the volatile solvent swelling agent to provide a resilient microporous article having said pressure expressible composition contained in its micropores, said composition being expressible upon the application of pressure.

11. A method, as in claim **1**, of forming a resilient microporous article having a pressure expressible composition contained in the micropores thereof, which comprises

(a) forming an article comprising a resilient solvent swelling agent swellable organic polymeric matrix having dispersed therein about 70% to about 95% of the filler article, of a leachable filler, said leachable filler having particle sizes between about 20 mesh and about 500 mesh,

(b) removing the leachable filler to provide a microporous article,

(c) contacting said microporous article with a mixture comprising:

(1) a pressure expressible composition, and

(2) about 10% to about 80% weight of the pressure expressible composition of a volatile solvent swelling agent, which swells the organic polymeric material forming the organic polymeric matrix, which has a greater volatility than any component of said pressure expressible composition, and which does not form an azeotrope with any component of said pressure expressible composition

for a time sufficient to swell the micropores at least about 25% and allow said mixture to penetrate into the microporous article and

(d) removing the volatile solvent swelling agent, causing said micropores to return substantially to their original size, said micropores containing said pressure expressible composition.

4,112,152
METHOD FOR MANUFACTURING POLYURETHANE FILMS AND SURFACE COATINGS FROM TALL OIL PITCH

Matti Dolk, Metsäpurontie 17 E 69, Helsinki; Väinö Erä, Suvantopolku 5 E, Myyrmäki, and Jarl Johan Lindberg, Ukonkivenpolku 1 G, Helsinki, all of Finland

Filed Apr. 2, 1976, Ser. No. 673,341
Int. Cl.² B05D *3/02;* **B32B** *15/08*
U.S. Cl. 427—385 R **6 Claims**

1. A method for manufacturing polyurethane films and surface coatings from tall oil pitch having an acid number of about 30–60 and an hydroxyl number of about 60–90, comprising:

(a) esterifying the tall oil pitch by adding to the tall oil pitch about 5–15 weight fractions of an aliphatic alcohol comprising at least three OH-groups, and about 0.1–0.5 weight fractions p-toluene sulfonic acid per 100 weight fractions tall oil pitch, and by heat treating at less than atmospheric pressure until the acid number of the mixture is about 5–35 and the hydroxyl number is about 200–350,

(b) adding an aliphatic tri-isocyanate preferably dissolved in an inert organic solvent, to the tall oil pitch ester thus attained in the amount such that the amount of isocyanate groups is 10–35 weight fractions per 100 weight fractions tall oil pitch ester,

(c) diluting the resultant mixture to a suitable consistency for the manufacture of films,

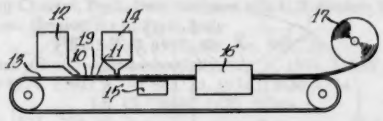
(d) spreading the resultant diluted mixture on a suitable base material, and

(e) polymerizing the resultant diluted mixture on the base material.

4,112,153
METHOD OF CONTROLLING WATER REPELLENCY IN NON-WOVEN FABRIC

George A. M. Butterworth, Western Springs, and Frank Fillwalk, Oak Lawn, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Apr. 4, 1977, Ser. No. 783,928
Int. Cl.² A61F *13/16;* **D21H** *1/34*
U.S. Cl. 427—390 E **21 Claims**



13. A method of preparing a bonded, non-woven fabric having a controlled degree of wettability comprising;

forming a web of randomly laid dry fibers,

impregnating the web with a liquid binder composition which includes a heat-unstable surfactant which is a member of the group consisting of a non-ionic surfactant, an anionic surfactant, and mixtures thereof,

drying the web to form a water-wettable, bonded, non-woven fabric,

heating a selected region of the fabric to an elevated temperature at which the surfactant is unstable, and

maintaining the fabric at the elevated temperature for a time period sufficient to denature the surfactant without damaging the fabric, thereby increasing the water repellency of the selected fabric region.

4,112,154
METHOD FOR OBTAINING UNIFORM POROSITY IN PRINTED INHERENTLY POROUS CIGARETTE TIPPING PAPERS

Stuart Wayne McCarty, Brevard, and Clarence Morris O'Shields, Hendersonville, both of N.C., assignors to Olin Corporation, Pisgah Forest, N.C.

Filed Sep. 2, 1977, Ser. No. 830,183
Int. Cl.² B32B *7/14;* **B44D** *5/00, 5/12*
U.S. Cl. 427—401 **6 Claims**

1. A method for obtaining uniform porosity in inherently porous cigarette tipping papers from base papers of differing relative porosities, comprising measuring the porosity of the base paper, coating the base paper with a liquid solution whose viscosity is adjusted according to the porosity of the base paper, said liquid solution selected from the group consisting of printing inks, coating suspensions, paper sizes, cellulose ethers and carboxymethylcellulose, said viscosity adjusted relatively higher for low porosity paper and relatively lower for high porosity paper, whereby the porosity is controlled to achieve a predetermined final uniform porosity in the area in which the coating is applied to the tipping paper.

4,112,155
PROCESS FOR SIZING SUBSTRATE AND PRODUCTS OBTAINED THEREBY

Philippe Robert Raymond Carel, Paris; René Paul Auguste Decamp, Villers Saint Paul, and Jean Perronin, Chantilly, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Division of Ser. No. 557,426, Mar. 11, 1975, Pat. No. 4,070,319.
This application Oct. 27, 1977, Ser. No. 846,096
Claims priority, application France, Mar. 11, 1974, 74 08114
Int. Cl.² D06P *5/00*
U.S. Cl. 427—439 **27 Claims**

1. Process for the surface sizing of a nonwoven, cellulose-based substrate which comprises impregnating the substrate in a sizing bath having a pH of 2 to 12, said bath containing as sizing agent at least one anionic latex of at least one copolymer

having a glass transition temperature of −40° C to +120° C and a K value of 55 to 130, said copolymer containing in interpolymerized form:

(a) 35% to 80% by weight of at least one ester of acrylic and/or methacrylic acid with an alcohol containing 1 to 18 carbon atoms and/or at least one vinyl ester of a carboxylic acid containing 1 to 18 carbon atoms;

(b) 20% to 50% by weight of acrylic, methacrylic, crotonic or itaconic acid, or a mixture thereof;

(c) 0% to 20% by weight of at least one monomer having an ethylene linkage and at least one polar group or containing several ethylene linkages;

(d) 0% to 30% by weight of at least one halogenated or non-halogenated hydrocarbon containing at least one double bond and 2 to 18 carbon atoms,

the latex containing 20% to 50% by weight of dry material, having a pH of 2 to 7, and having the property of thickening by treatment with alkali.

4,112,156

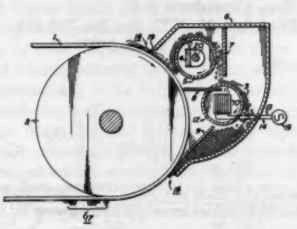
MAGNETIC TONER RECOVERY METHOD USING ALTERNATING MAGNETIC FIELD POLARITIES

Stanley B. Swackhamer, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 690,211, May 26, 1976, Pat. No. 4,043,298. This application Feb. 14, 1977, Ser. No. 768,240

Int. Cl.² B05D *3/00*

U.S. Cl. 427—444 **2 Claims**



1. A method for recovering airborne toner from the vicinity of a magnetizable recording medium, comprising: magnetically attracting airborne magnetic toner with a magnetic field which does not alternate in magnetic polarity thereby magnetically polarizing said magnetic toner; and passing said polarized magnetic toner through a magnetic field which alternates in magnetic polarity thereby decreasing the magnetic polarization of said magnetic toner.

4,112,157

METHOD OF PRODUCING A FILM WHICH PROMOTES HOMEOTROPIC ORIENTATION OF LIQUID CRYSTALS AND A LIQUID CRYSTAL UTILIZING THE FILM

Hans Krueger; Hans F. Mahlein, and Walter Rauscher, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 479,847, Jun. 17, 1974, abandoned. This application May 17, 1976, Ser. No. 686,934

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1973, 2330909

Int. Cl.² C09K *3/34*

U.S. Cl. 428—1 **9 Claims**

1. In a liquid crystal cell having a thin layer of liquid crystal material interposed between a pair of spaced, parallel carrier plates with at least one of said plates being transparent, the improvement comprising a thin film of metal inorganic salt deposited on at least a portion of a surface of one of said plates and being in contact with the liquid crystal material, said thin film having a column-like structure extending at an angle to the surface of the plates so that the molecules of the liquid crystal material contacting the film assume a homeotropic orientation to the surface of the plate.

3. A method of producing a film of metal inorganic salt on a surface of a carrier plate having an electrical conducting material to form electrodes on the surface, said film having a column-like structure extending substantially normal to the surface, said carrier plate being used in a liquid crystal cell comprising a layer of liquid crystal material interposed between a pair of parallel spaced carrier plates with the molecules of the layer of liquid crystal material which contacts the film having a homeotropic orientation relative to the surface of the carrier plate, said method comprising the steps of providing a source of the metal inorganic salt; positioning a carrier plate with the electrodes on the surface at a distance from the source of the salts which distance is substantially larger than the area of said surface to be provided with the film and with said surface facing the source and being oriented substantially normal to a line extending from said surface to the source; then vaporizing the metal inorganic salts; and depositing the vaporized salts on said surface as the film having a column-like structure extending substantially normal to the surface of the plate, so that the direction of movement of the vaporized salts being deposited on the surface is substantially parallel to said line and normal to said surface.

4,112,158

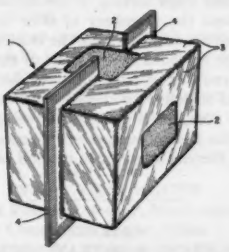
PACKAGING FILMS AND PACKAGED ARTICLES THEREWITH

Mark D. Creekmore, Akron, and William A. Watts, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 617,930, Sep. 29, 1975, abandoned. This application Sep. 28, 1977, Ser. No. 837,483

Int. Cl.² B32B *7/02;* **B65D** *71/00;* **C08L** *51/00*

U.S. Cl. 428—35 **28 Claims**



1. A packaging film composite having a thickness in the range of about 0.5 to about 10 mils comprised of an admixture of (1) 100 parts by weight of an unvulcanized elastomeric block copolymer having the general configuration A-B-A wherein each A is an independently selected nonelastomeric monovinyl aromatic hydrocarbon polymer block selected from styrene, α-methylstyrene and vinyl toluene having an average molecular weight of about 7,000 to about 25,000 and a glass transition temperature above about 25° C., the total block A content being from about 20 to about 40 percent by weight of the copolymer, and B is an elastomeric conjugated diene polymer block selected from 1,3-butadiene and isoprene having an average molecular weight from about 30,000 to about 100,000 and a glass transition temperature below about 10° C., said block copolymer being further characterized by having a melt viscosity in the range of about 0.1 to about 10 grams/10 minutes according to ASTM No. D-1238, (2) about 0.5 to about 9 total parts by weight of antiblock agent composed of about 0.1 to about 3 parts by weight individually of stearyl erucamide, oleyl palmitamide and behenamide in combinations of (A) stearyl erucamide and behenamide, (B) oleyl palmitamide and behenamide and (C) stearyl erucamide, oleyl palmitamide and behenamide, and (3) about 25 to about 120 parts by weight of

a thermoplastic resin selected from at least one polymer of styrene, α-methyl styrene, styrene/α-methylstyrene, vinyl toluene, vinyl toluene/α-methylstyrene, indene resins, alkyl phenolic resins and petroleum and coal tar resins, said resins characterized by being soluble in styrene and by having an intrinsic viscosity of about 0.02 to about 0.50 as determined in toluene at 30° C.

4,112,159

CONTINUOUS PRODUCTION OF TUBULAR MODULAR FILTER ELEMENTS USING NONWOVEN WEBS FROM THERMOPLASTIC FIBERS AND PRODUCTS

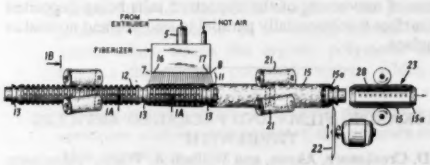
David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 393,688, Aug. 31, 1973, Pat. No. 3,933,557. This application Jan. 14, 1976, Ser. No. 649,001

The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.

Int. Cl.[2] B01D *29/10*

U.S. Cl. 428—36 **8 Claims**



1. A seamless tubular filter element comprising a tubular foraminous core having superimposed and supported thereon in the form of a cylinder a flexible wound layer of randomly-oriented heterogeneously intertwined spun fibers less than 10 μin diameter and having an open area of at least 60%, laid down on the core and having end caps at each end of the cylinder, the end caps having a circumferential relatively narrow slot about the periphery of their inside face whose width at the inside face is less than the thickness of the end of the core plus the folded-over thickness of the layer; the layer having at each end a flexible selvage extending beyond the end of the core and folded over the end and extending into the interior of the core, with the folded-over portion sealingly compressed in the slot between the core end and the side walls of the slot, and thereby attached to the end caps in a leak-tight seal.

4,112,160

SOLID ADHEREND SUBSTRATES BONDED WITH RUBBER CEMENT COMPOSITIONS

Yuji Kako, Shizuoka; Toyoji Kikuga, and Akira Toko, both of Fujieda, all of Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Division of Ser. No. 519,314, Oct. 30, 1974, Pat. No. 4,007,233, which is a continuation-in-part of Ser. No. 322,265, Jan. 9, 1973, abandoned. This application Dec. 15, 1976, Ser. No. 750,942

Claims priority, application Japan, Jan. 11, 1972, 47-4950

Int. Cl.[2] B32B *15/06, 15/18, 15/08, 15/10*

U.S. Cl. 428—460 **21 Claims**

1. In a bonded article comprising at least two solid adherend substrates bonded with a rubber cement composition comprising nitrile rubber and a phenolic resin derived from a monohydroxyphenol, the improvement wherein the phenolic resin consists essentially of phenolic resin produced by (a) condensing a bifunctional phenol and an aldehyde in a molar ratio of about 0.5 to 3 moles of aldehyde per mole of bifunctional phenol under alkaline conditions, and (b) reacting the resulting condensation product with a polyfunctional phenol having at least 3 reactive positions on the phenyl nucleus in a molar ratio of about 0.05 to 2.5 moles of polyfunctional phenol per mole of bifunctional phenol in said condensation product in the presence of a sufficient amount of acid to provide acid catalysis of the condensation of the aldehyde and the phenol, to produce a phenolic resin having a number average molecular weight of about 700 to 1,900 and a melting point of about 80° to 160° centigrade.

17. In a bonded article comprising an adherend substrate of flexible polyvinyl chloride bonded to at least one other adherend substrate with a rubber cement composition comprising nitrile rubber and a phenolic resin derived from a monohydroxyphenol, the improvement wherein the phenolic resin consists essentially of phenolic resin produced by (a) condensing a bifunctional phenol and an aldehyde in a molar ratio of about 0.5 to 3 moles of aldehyde per mole of bifunctional phenol under alkaline conditions, and (b) reacting the resulting condensation product with a polyfunctional phenol having at least 3 reactive positions on the phenyl nucleus in a molar ratio of about 0.05 to 2.5 moles of polyfunctional phenol per mole of bifunctional phenol in said condensation product in the presence of a sufficient amount of acid to provide acid catalysis of the condensation of the aldehyde and the phenol, to produce a phenolic resin having a number average molecular weight of about 700 to 1,900 and a melting point of about 80° to 160° centigrade.

4,112,161

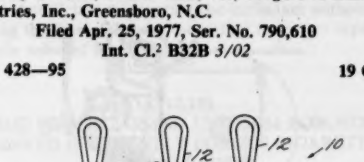
TUFTED PILE FABRIC AND METHOD OF MAKING AND INSTALLING THE SAME

Samuel Ray Sorrells, Buena Vista, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 25, 1977, Ser. No. 790,610

Int. Cl.[2] B32B *3/02*

U.S. Cl. 428—95 **19 Claims**



1. A tufted pile fabric having a dimensional stability, a soft hand and being capable of breathability so it can be permanently secured to a floor structure by a water based adhesive comprising:

a synthetic plastic primary backing of substantially uniform thickness;

a series of synthetic plastic pile projections extending through said primary backing and outwardly from one face thereof;

a synthetic plastic secondary backing of substantially uniform thickness;

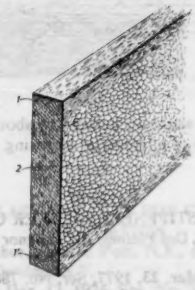
means adhesively securing said secondary backing to the other face of said primary backing and anchoring said series of pile projections to said primary backing, said last mentioned means including a hot melt adhesive provided between said primary backing and said secondary backing and defining a substantially impervious and relatively inflexible sheet anchoring the pile projections, primary backing and secondary backing together to provide dimensional stability to the pile fabric; and

a plurality of perforations through said pile fabric over its entire surface, each of said perforations extending completely through the secondary backing, impervious relatively inflexible sheet of hot melt adhesive, and the primary backing, said perforations having a size and spacing sufficient to increase flexibility of and cause the impervious sheet to become pervious so as to provide a soft hand for the pile fabric and to provide breathability to the pile fabric while maintaining dimensional stability of the same.

4,112,162
STRUCTURAL CHIPBOARD WOOD BEAM

Sven Gustav Casselbrant, Lidingö, Sweden, assignor to Svenska Utvecklingaktiebolatget, Stockholm, Sweden

Filed Mar. 27, 1974, Ser. No. 455,146
Int. Cl.[2] B32B 5/12
U.S. Cl. 428—106 7 Claims

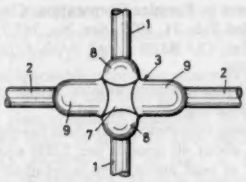


1. A structural beam of compressed glued wood chips comprising three layers (1, 1', 2) of said chips, each of said layers extending over the entire length of the beam, said layers being stacked in the direction of the wider and normally vertical cross-sectional dimension of the beam, the outer and normally upper and lower layers (1, 1') consisting predominantly of chips having a shape elongated in the principal direction of orientation of their respective fibers, said chips of said outer layers (1, 1') being oriented in said layers with their long dimension substantially in the longitudinal direction of the beam and the middle layer (2) consisting predominantly of flat chips having their fibers oriented substantially in normally vertical planes, which planes are parallel to the longitudinal direction of the beam and within which planes the fibers of the chips are randomly oriented.

4,112,163
NET FOR FORMING AN ELASTIC SUPPORT IN FURNITURE

Manfred Brokmann, Silcherstr. 5; Kurt Sanders, Friedrichstr. 29; Dieter Sanders, Haneschweg 2, and Hermann Westhoff, Augustenburgerstr. 85a, all of, 4500 Osnabrueck, Fed. Rep. of Germany

Filed Jul. 13, 1976, Ser. No. 704,769
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1975, 2532613
Int. Cl.[2] B32B 5/12
U.S. Cl. 428—107 3 Claims



1. A net for supporting upholstery in furniture, comprising, in combination:

(a) a plurality of longitudinal cords and a plurality of transverse cords extending prependicularly relative to said plurality of longitudinal cords, preselected longitudinal cords contacting preselected transverse cords so as to form a plurality of cross-over points therewith,

(b) a molded synthetic connecting member at each cross-over point completely enclosing said longitudinal and transverse cord at said cross-over points,

(c) said connecting member having a first pair of shank portions extending in opposite directions along said transverse cord and completely enclosing said transverse cord in the region of the cross-over point,

(d) a second pair of shank portions extending in opposite directions along said longitudinal cord and completely enclosing said longitudinal cord in the region of said cross-over point,

(e) said shanks of said first pair being longer than said shanks of said second pair,

(f) said longitudinal and transverse cords being prestressed prior to molding the connecting members onto the transverse and longitudinal cords at the cross-over points,

(g) said transverse and longitudinal cords having uneven surfaces, said enclosing connecting member contacting completely said uneven surfaces in the region of said cross-over points,

(h) and wherein said connecting member is made of polyethylene.

4,112,164
ACOUSTICAL LAMINATE

Muriel L. Koss, Arlington, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Division of Ser. No. 672,353, Mar. 31, 1976, Pat. No. 4,091,160.
This application Dec. 1, 1977, Ser. No. 856,519
Int. Cl.[2] B32B 3/12
U.S. Cl. 428—116 3 Claims

1. An acoustic panel comprising:

an acoustic laminate face sheet comprising at least two plies of an open weave glass fiber fabric impregnated with from about 13 to 32 weight percent epoxy resin, based on the weight of said glass fabric, said laminate having an airflow resistance of from about 2 to 60 rayls at an airflow velocity of about 17 cm/sec;

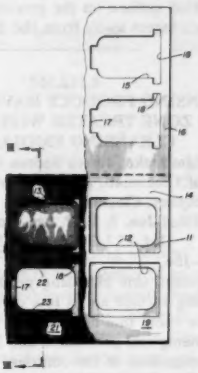
a core comprising an open honeycomb having a thickness of from about 0.20 to 2.0 inches bonded to said acoustic laminate face sheet; and

a continuous air-impervious backing sheet bonded to the surface of said core opposite to said face sheet.

4,112,165
X-RAY FILM MOUNT

Malcolm Clifford Russell, Leicester, Mass., assignor to Russell Manufacturing Company, Leicester, Mass.

Filed May 21, 1976, Ser. No. 688,848
Int. Cl.[2] G09F 1/10
U.S. Cl. 428—134 2 Claims



1. A mount for X-ray film element, comprising:

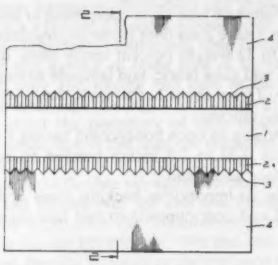
(a) a first panel having primary apertures, each of which is smaller than a film element,
(b) a second panel having secondary apertures similar to the primary apertures,
(c) notches extending from opposite ends of each of the secondary apertures comprising, a first notch which is rectangular and whose length is less than the width of the aperture, and a second notch which is elongated and whose length is greater than the width of a film element,
(d) a coating of visually-evident nature provided on the inner surface of the first panel to be exposed by the said notches in the second panel, the outer surface of the second panel having a dark color and the said coating on the inner surface of the first panel being of a relatively light contrasting color, and
(e) an adhesive connecting the first and second panels in a face-to-face relationship with the primary and secondary apertures in substantial registry with the exception that a strip of adhesive-free inner surface is provided around the primary aperture to allow the insertion of the film element.

4,112,166

METHOD OF EXTRUDING THERMOPLASTIC SHEETS

Hyun S. Chyu, Chicopee, Mass., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 537,975, Jan. 2, 1975, Pat. No. 3,994,654. This application Jul. 9, 1976, Ser. No. 703,732
Int. Cl.[2] B28B *21/54*
U.S. Cl. 428—141 **12 Claims**



1. In the method for forming thermoplastic sheet material having controlled surface roughness said method comprising extruding the thermoplastic sheet material through an extrusion apparatus comprising an extruder and a die member wherein at least one of the lips of the die member is grooved in the direction of extrusion, the improvement which comprises having a beveled surface on the grooved die lip wherein the beveled surface tapers away from the die orifice.

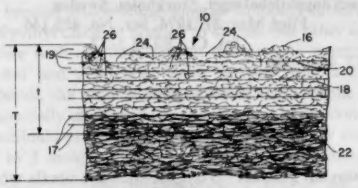
4,112,167

SKIN CLEANSING PRODUCT HAVING LOW DENSITY WIPING ZONE TREATED WITH A LIPOPHILIC CLEANSING EMOLLIENT

Timothy William Dake; James Spence Clunie, and Allen Dale Early, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 7, 1977, Ser. No. 757,712
Int. Cl.[2] B32B *3/00, 21/04*
U.S. Cl. 428—154 **15 Claims**

1. A soft, pliant, skin cleansing product comprising a web having a wiping surface and a low density wiping zone; said wiping surface being one boundary of said wiping zone; said wiping zone being soil permeable and having surface depressions which contribute to the contours of said wiping surface and having subsurface voids below said wiping surface, said wiping zone having an average void index as determined under a pressure of 1 pound per square inch of at least 68 and a minimum void index of at least 10; said wiping zone being



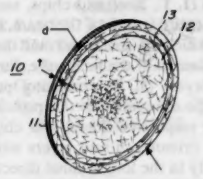
treated with from about 10 percent to about 150 percent by weight of said web of a lipophilic cleansing emollient.

4,112,168

HIGH STIFFNESS SPEAKER CONE

Hugo Willy Schafft, Des Plaines, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 23, 1977, Ser. No. 780,619
Int. Cl.[2] B32B *7/14*
U.S. Cl. 428—198 **14 Claims**



1. An improved lightweight, stiff member comprising:
a porous layer of high stiffness fibers, said fibers being randomly oriented, spaced-apart, and crossing over at given points to form a porous layer having a predetermined thickness profile, said layer of fibers having a first major surface;
means for gastight sealing the layer of fibers along the first surface of the layer; and
means for bonding together the fibers at the given crossover points and for bonding the gastight sealing means to the first major surface of the layer of fibers.

4,112,169

ELASTOMER MODIFIED MELAMINE RESIN CONTAINING LAMINATES

Kenneth Robert Huffman, Stamford; Donald James Casey, Ridgefield, and Walter Moreland Thomas, Darien, all of Conn., assignors to Formica Corporation, Cincinnati, Ohio

Filed Feb. 11, 1977, Ser. No. 767,718
Int. Cl.[2] B32B *27/42, 3/10, 5/16*
U.S. Cl. 428—206 **10 Claims**

1. A heat and pressure consolidated article comprising
(A) a self-supporting substrate and
(B) a decorative, cellulosic paper sheet having a basis weight of at least about 40 pounds per 3,000 square foot ream, containing at least about 60% α-cellulose and being impregnated with a composition of matter comprising a mixture of
(1) an aqueous melamine/formaldehyde resin solution wherein the melamine to formaldehyde ratio thereof ranges from about 1:1.6 to about 1:2.5 and
(2) from about 2.5 to about 30.0%, by weight, based on the weight of the resin solids of (1), of an elastomer comprising
(a) an ethylene/vinyl chloride copolymer containing a comonomer supplying from about 0.5 to about 7.0%,

by weight, based on the total weight of (a), of amide groups or

(b) a polyurethane resin containing from about 3.0 to about 10.0%, by weight, based on the total weight of (b), of carboxyl groups,

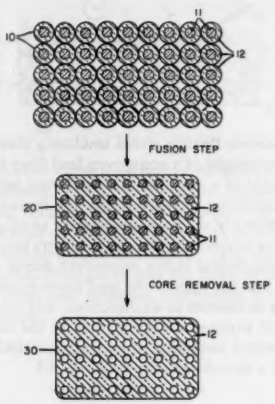
said elastomer having a particle size of up to about 20,000 Angstroms.

4,112,170

COMPOSITE GLASS ARTICLES FOR CHANNEL PLATE FABRICATION

Herbert E. Rauscher, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,677
Int. Cl.[2] B32B *7/02, 17/06*
U.S. Cl. 428—212 **4 Claims**



1. A composite glass article suitable for the manufacture of a glass body comprising an array of channels which consists of:

(a) an interconnected glass matrix composed of a non-leachable lead silicate matrix glass having an average linear coefficient of thermal expansion over the temperature range 0°-300° C. of not less than about 70×10^{-7}/° C., a softening point not exceeding about 650° C., and a dissolution rate in 1N HNO_3 not exceeding about 5×10^{-5} milligrams per square centimeter of exposed surface area per minute at 25° C., and

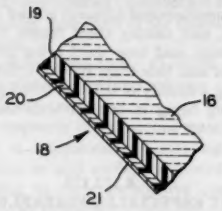
(b) an array of leachable core glass elements encased in said glass matrix, each of said core glass elements being composed of a glass consisting essentially, in weight percent on the oxide basis, of about 38-64% BaO, 0-17% CaO, 0-3% MgO, 49-67% total of BaO + CaO + MgO, 8-45% B_2O_3, 6-34% SiO_2, 32-51% total of $B_2O_3 + SiO_2$, at least 88% total of BaO + CaO + M_2O + B_2O_3 + SiO_2, 0-12% Al_2O_3, 0-10% TiO_2, 0-7% ZrO_2, 0-3.5% Na_2O and 0-4% ZnO, said glass having an average linear coefficient of thermal expansion over the temperature range 0-300° C. not exceeding about 105×10^{-7}/° C., a softening point of at least about 645° C., a dissolution rate in 1N HNO_3 of at least about 0.4 milligrams per square centimeter of exposed surface area per minute at 25° C., and being essentially free of La_2O_3 and ThO_2.

4,112,171

AUTOMOTIVE GLAZING STRUCTURE AND METHOD OF PRODUCING THE SAME

Theodore J. Motter, Genoa; Paul T. Mattimoe, and Stephen P. Bartus, Jr., both of Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Continuation-in-part of Ser. No. 608,830, Aug. 29, 1975, abandoned. This application Jan. 14, 1977, Ser. No. 759,331
Int. Cl.[2] B32B *7/02*
U.S. Cl. 428—213 **8 Claims**



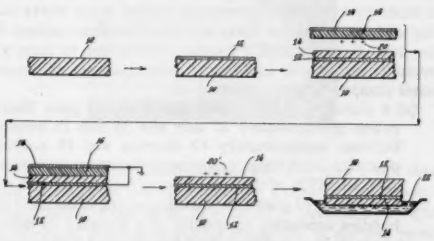
1. A transparent, temperature stable, glazing structure, comprising the combination: with a surface of glass; of a layer of a relatively soft and extensible, penetration resistant, plastic having one surface bonded to said glass; a thinner layer of a more durable plastic having one surface bonded to said relatively soft layer and its opposite surface treated to promote adhesion; an abrasion resistant coating of a cured organopolysiloxane compound on said treated surface; and an exposed surface on said coating that has been silane catalyzed before curing to impart the highest degree of cure at said exposed surface and to render said coating progressively harder outwardly through its thickness toward said exposed surface.

4,112,172

DIELECTRIC IMAGING MEMBER

Herman Burwasser, Boonton, and John R. Wyhof, Wanaque, both of N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 669,675, Mar. 23, 1976, abandoned. This application Aug. 27, 1976, Ser. No. 718,361
Int. Cl.[2] G03G *7/00*
U.S. Cl. 428—215 **5 Claims**



1. An improved dielectric imaging member for receiving electrostatic latent images in the absence of an externally applied voltage so as to provide sharp density images consisting essentially of a transparent resin film substrate, a conductive layer on said substrate, and a dielectric resin film in which said dielectric film has a thickness in the range of about 1.4-10 micrometers on said conductive layer for receiving said latent images.

4,112,173
CONCRETE MODULE UNIT

Allen T. Roudebush, Hamilton, Ohio, and Kenneth P. Thompson, Canton, N.C., assignors to Champion International Corporation, Stamford, Conn.

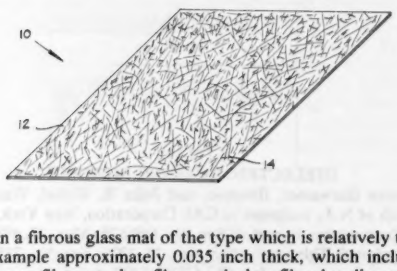
Division of Ser. No. 547,003, Feb. 4, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,770
Int. Cl.[2] B32B *13/12, 27/10, 7/06*
U.S. Cl. 428—215 **13 Claims**

8. A concrete module unit comprising a concrete layer having a thin, flexible casting sheet means having a low release resistance when separated from said concrete layer after hardening thereof superimposed adjacent at least one surface of said concrete layer, said casting sheet means comprising a thin, flexible base sheet, said base sheet being generally planar, at least one side of said base sheet having a thin coating of polyethylene having a density of 0.930 to 0.965 gm./cc., said polyethylene coating being in contact with said surface of said concrete layer.

4,112,174
FIBROUS MAT ESPECIALLY SUITABLE FOR ROOFING PRODUCTS

George John Hannes, Maumee; Theodore Richard Rohweder; Hans Wendell Dreikorn, both of Toledo, all of Ohio, and Philip Bickford Shepherd, Sedalia, Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 650,108, Jan. 19, 1976, abandoned, which is a continuation of Ser. No. 518,332, Oct. 29, 1974, abandoned, which is a continuation of Ser. No. 301,578, Oct. 27, 1972, abandoned. This application Jul. 21, 1976, Ser. No. 707,165
Int. Cl.[2] D06N *5/00*
U.S. Cl. 428—220 **5 Claims**



1. In a fibrous glass mat of the type which is relatively thin, for example approximately 0.035 inch thick, which includes both monofilament glass fibers and glass fiber bundles and a binder substance to cooperate in holding the monofilament fibers and fiber bundles together to form said mat, and which is made by a process of preparing a dilute water slurry including said monofilament fibers and fiber bundles, vacuum filtering said slurry through a moving wire screen to form a web which together with said binder forms said mat, the improvement comprising the utilization of:

(a) a plurality of individual monofilament glass fibers between approximately 22 mm and 35 mm in length and between approximately 12 microns and 19 microns in diameter, said fibers comprising between approximately 70% and 95% of the total fibrous material in said web,

(b) a plurality of glass fiber bundles having ends, each of said bundles consisting essentially of a plurality of monofilaments held together in said bundle by a water insoluble binder substance, said glass fiber bundles being between approximately 65 mm and 75 mm in length, and comprising between approximately 5% and 30% of the total fibrous material in said web; and

(c) a relatively small amount of binder substance to cooperate in holding said web of monofilament fibers and fiber bundles together to form said mat;

(d) said mat consisting essentially of said monofilament fibers, said fiber bundles and said binder and said monofilament fibers and fiber bundles cooperating with one another in a random fashion to form said web such that

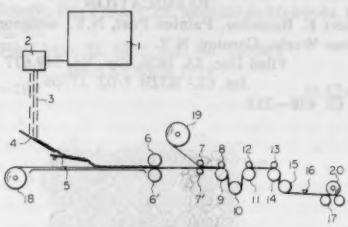
(i) said monofilament fibers and fiber bundles are substantially randomly oriented and uniformly dispersed throughout said web and,

(ii) a majority of the ends of said bundles are within the confines of said web.

4,112,175
SOUND INSULATING SHEET CONTAINING LEAD FIBERS

Yoshikazu Kikuchi; Hirotsugu Suzuki, and Kenji Yabe, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 481,401, Jun. 20, 1974, abandoned. This application Dec. 1, 1976, Ser. No. 746,319
Int. Cl.[2] B32B *5/02*
U.S. Cl. 428—236 **5 Claims**

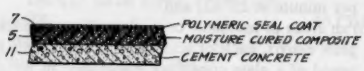


1. A nonporous flexible sound insulating sheet composed of 50 to 90% by weight of a nonwoven lead fiber fabric and 10 to 50% by weight of a vinyl chloride polymer reinforcing material, said reinforcing material filling the spaces between individual lead fibers of the nonwoven fabric to secure the individual lead fibers in their place; said lead fibers being substantially uniformly distributed in the nonwoven fabric and being disposed such that the axes of the lead fibers extend, as a whole, substantially at random in all directions, and such that the lead fibers are not exposed on the surface of the sound insulating sheet, said sound insulating sheet having a thickness of 0.3 to 2.0 mm and a specific gravity of 2.0 to 6.5.

4,112,176
GROUND RUBBER ELASTOMERIC COMPOSITE USEFUL IN SURFACINGS AND THE LIKE, AND METHODS

Allen R. Bailey, Vicksburg, Miss., assignor to U.S. Rubber Reclaiming Co., Inc., Miss.

Continuation-in-part of Ser. No. 486,328, Jul. 8, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,751
Int. Cl.[2] B32B *3/26, 5/16;* **C09J** *3/18*
U.S. Cl. 428—304 **15 Claims**



1. A flexible resilient elastomeric composite composed of vulcanized rubber particles substantially coated and bonded with a cross-linked non-foamed binder consisting essentially of a solvent-free polymeric isocyanate prepolymer cross-linked by urea and biuret linkages and having an excess NCO content of 3–10% and a number average molecular weight between 800 and 4000, said cross-linking of the isocyanate prepolymer being accomplished by the controlled reaction fo prepolymer components in an equivalent ratio NCO/OH of 0.14/1 to 0.83/1; the film thickness of the prepolymer binder on the rubber particles being from about 3 microns to about 10 mi-

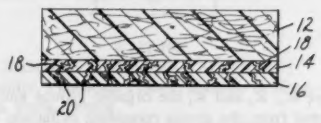
crons and the void content of the composition being between 25 and 60 percent.

13. A method of forming a flexible resilient and elastomeric composite which comprises substantially coating vulcanized rubber particles to a thickness of about 3 microns to about 10 microns; with a non-foaming cross-linked binder consisting essentially of a solvent-free polymeric isocyanate prepolymer having a number average molecular weight between 800 and 4000, cross-linking said prepolymer by a controlled reaction with water at an equivalent ratio of NCO/OH of 0.14/1 to 0.83/1 to form urea and biuret cross-linkages; said cross-linked coating having a void content of about 25 percent to 60 percent; and consolidating and bonding said coated particles.

4,112,177
POROUS ADHESIVE TAPE

Ferdinand Salditt, Vallendar, Fed. Rep. of Germany, and William L. Hansen, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 23, 1978, Ser. No. 871,377
Int. Cl.² B32B *3/26*
U.S. Cl. 428—304 **5 Claims**

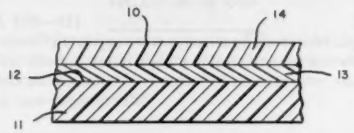


2. A microporous pressure-sensitive adhesive coated sheet material comprising a thin substantially uniformly porous substrate having firmly anchored to one major surface thereof a thin adhesive mass composed of a plurality of normally tacky and pressure-sensitive adhesive layers, said adhesive mass being microporous throughout and the layer of said adhesive mass farthest from said substrate comprising a soft rubbery acrylate copolymer.

4,112,178
AQUEOUS POLYURETHANE UNDERCOATS

Albert E. Brown, Glen Cove, N.Y., assignor to Columbia Ribbon & Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Filed Jul. 14, 1977, Ser. No. 815,633
Int. Cl.² B32B *3/26*
U.S. Cl. 428—306 **10 Claims**



1. Pressure-sensitive transfer element comprising a smooth, non-tacky base layer of water-applied polyurethane resin having bonded to the smooth surface thereof, a volatile-solvent-applied pressure-sensitive ink-releasing microporous resinous layer containing within the pores thereof pressure-exudable ink comprising oleaginous material and coloring matter, said base layer being impermeable and insoluble with respect to the volatile vehicle used to apply the ink layer and being inert to the penetration of the oily ink vehicle of the ink layer present thereon.

4,112,179
METHOD OF COATING WITH ABLATIVE HEAT SHIELD MATERIALS

Joseph W. Maccalous, 7210 S. Sheridan Ct., Littleton, Colo. 80123, and Donald A. Thomas, 3005 W. Tufts Ave., Englewood, Colo. 80110

Filed Dec. 10, 1975, Ser. No. 639,503
Int. Cl.² B32B *5/16*; B05D *1/02*
U.S. Cl. 428—325 **11 Claims**

1. A method for producing an ablative coating on a surface consisting essentially of:

preparing a sprayable coating composition by mixing components consisting essentially of the following ingredients

(a) a silicone resin;

(b) a solvent system comprising 85–100% n-heptane and 15–0% of a higher boiling inert solvent;

(c) silicaceous fibers; and

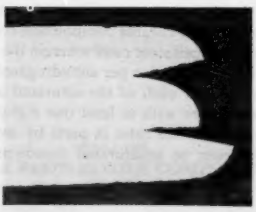
(d) hollow microspheres of silicaceous material, and

subsequently and in a separate step spraying the sprayable coating composition on said surface, followed by curing the thus-formed coating to form an ablative coating having a density of about 10 to 15 lbs/ft³.

4,112,180
REFRACTORY METAL CARBIDE ARTICLES AND LAMINATING METHOD FOR PRODUCING SAME

James Q. Steigelman, Athens, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 2, 1974, Ser. No. 511,441
Int. Cl.² B32B *3/10*; B22F *3/00*
U.S. Cl. 428—332 **3 Claims**



1. A self supporting flexible laminate of at least 3 self supporting flexible tape cast sheets having a composition consisting essentially of from about 70 to about 97 percent by weight of an inorganic portion consisting essentially of discrete particles of (a) from about 75 to 97 weight percent of a refractory metal carbide, and (b) from about 3 to 25 weight percent of a lower melting binder metal, suspended in from about 3 to about 30 weight percent of a solid organic portion, said laminate characterized by having a thickness greater than about 0.080 inches defined by at least two uneroded formed surfaces, and further characterized by having a cross section through said surfaces of substantially uniform appearance across said thickness.

4,112,181
METHOD FOR PREPARING A FILM OF VINYLIDENE CHLORIDE POLYMER

William G. Baird, Jr., Spartanburg; Stanley E. Holbrook, Greenville, both of S.C., and Jeremy A. Platt, deceased, late of Cambridge, Mass., assignors to W. R. Grace & Co., Duncan, S.C.

Continuation of Ser. No. 460,855, Apr. 5, 1974, Pat. No. 4,048,428, which is a continuation of Ser. No. 114,692, Feb. 11, 1971, Pat. No. 3,821,182, which is a division of Ser. No. 590,107, Jun. 2, 1966, abandoned, which is a division of Ser. No. 157,194, Dec. 5, 1961, abandoned. This application Mar. 1, 1976, Ser. No. 662,660

The portion of the term of this patent subsequent to Jun. 28, 1991, has been disclaimed.

Int. Cl.[2] B32B *27/32*

U.S. Cl. 428—336 8 Claims

1. A film combination comprising two outer plies of thermoplastic polymer and disposed therebetween a thin biaxially oriented crystalline copolymer film made of a thermoplastic copolymer of vinylidene chloride and at least one copolymerizable monomer, wherein the vinylidene chloride is at least 50% of the material in the copolymer, said film combination having been made by extruding said copolymer as a melt between melts of outer plies of thermoplastic polymer through a die, cooling and stretching to orient so as to produce a copolymer film between the outer plies, said copolymer film being substantially devoid of pinholes and scratches and having low oxygen permeability.

4,112,182
PLASTIC MOLDINGS AND SHEETING

Gordon C. Newland, and James G. Pacifici, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,395

Int. Cl.[2] B32B *27/30, 27/16*

U.S. Cl. 428—336 6 Claims

1. A formed cellulose ester article having surface portions coated with a radiation-curable composition comprising ethylenically unsaturated cellulose ester wherein the average degree of saturation and unsaturation per anhydrogluclose unit is from 0.1 to less than 3.0 of each of the saturated and unsaturated moieties, in admixture with at least one α,β-unsaturated carboxylate comonomer, the ratio in parts by weight of unsaturated cellulose ester to unsaturated comonomer being from 1/20 to 20/1.

4,112,183
FLEXIBLE RESIN RICH EPOXIDE-MICA WINDING TAPE INSULATION CONTAINING ORGANO-TIN CATALYSTS

James D.B. Smith, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

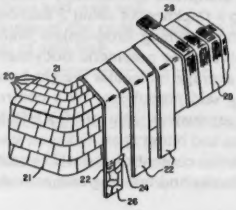
Filed Mar. 30, 1977, Ser. No. 782,696

Int. Cl.[2] H02K *1/04, 3/30;* B32B *27/38, 19/00*

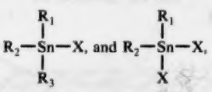
U.S. Cl. 428—363 17 Claims

1. A method of making a highly flexible, mica insulation winding tape sheet material comprising the steps of:

(a) mixing epoxide resin selected from the group consisting of semi-solid epoxide, a mixture of solid epoxide and liquid epoxide and a mixture of semi-solid epoxide and liquid epoxide, with solvent for the epoxide resin, where the weight ratio of total epoxide:total solvent is from about 85:15 to 30:70; and then



(b) mixing the epoxide resin-solvent mixture, with from 0.01 to 5.0 parts per 100 parts epoxide resin of an organo-tin compound, having a structural formula selected from the group consisting of:



where R_1, R_2 and R_3 are organic groups and each X is selected from the group consisting of halide, hydroxide, acetate, butyrate, propionate, and dimethyl phosphate, to form a homogeneous admixture; and then

(c) applying the homogeneous epoxide resin-solvent-organo-tin admixture to a flexible sheet material comprising mica, so that organo-tin compound contacts mica causing the organo-tin compound to act as a latent catalyst; and then

(d) removing at least 95 weight percent of the solvent from the epoxide resin-solvent-organo-tin catalyst admixture in the sheet material without any substantial curing of the epoxide resin or reaction of the organo-tin compound, forming a flexible sheet with substantially unreacted epoxide resin and causing an increased amount of substantially unreacted organo-tin compound to contact mica in the sheet material; wherein the amount of organo-tin compound added is effective to advance the epoxide resin in the sheet material from the substantially unreacted state to a cured thermoset state upon heating over a resin-catalyst temperature of 120° C.

4,112,184
MAGNETIC RECORDING MEDIUM AND METHOD OF PREPARING

Shinji Umeki; Tatsuo Uebori, and Minoru Motegi, all of Tokyo, Japan, assignors to TDK Electronic Company, Tokyo, Japan

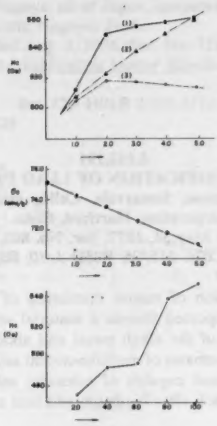
Continuation of Ser. No. 609,663, Sep. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 444,651, Feb. 21, 1974, abandoned. This application Oct. 7, 1976, Ser. No. 730,581

Int. Cl. H01f *10/02*

U.S. Cl. 428—403 6 Claims

1. A method of preparing a magnetic recording medium, which comprises:

depositing magnetic particles of ferromagnetic, acicular iron oxide upon whose surface is absorbed from 0.5 to 10 wt.



% cobalt hydroxide in a non-ferrite form based on said iron oxide, on a supporting substrate.

4,112,185

MODIFIED MINERAL SUPPORTS

François Meiller, Palaiseau, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Aug. 25, 1975, Ser. No. 607,094

Claims priority, application France, Aug. 30, 1974, 74 29702

Int. Cl.[2] B32B *5/16, 9/00*

U.S. Cl. 428—403 **7 Claims**

1. Porous mineral support materials comprising modified mineral carriers having a grain size range of from 5 μ to 5 mm, a specific surface area of from 2 to 1000 sq.m/g, a pore diameter of from 50 to 10,000 A, and a pore volume of 0.5 to 1.3 ml/g said carrier being in the form of particles coated with a cross-linked polymer formed of the reaction of at least one polyamine on at least one epoxidic compound and present in an amount within the range of 1–60% by weight of the carrier.

4,112,186

ULTRAVIOLET ABSORBING COATINGS

Roger W. Lange, and Harold G. Sowman, both of Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 534,371, Dec. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 455,212, Mar. 27, 1974, abandoned. This application Jan. 28, 1977, Ser. No. 763,603

Int. Cl.[2] B32B *9/04*

U.S. Cl. 428—411 **2 Claims**

1. A visually transparent composite of ultraviolet degradable polymeric sheet material and on at least one surface ultraviolet light absorptive insoluble complex of titanate ester and soluble stannous non-organic salt.

4,112,187

MAGNETIC RECORDING MEDIUM SUPPORTED ON AROMATIC POLYAMIDE

Toshiyuki Asakura; Masaaki Itoga, both of Otsu; Takeshi Hayakawa, Kyoto, and Masamitsu Tanimura, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

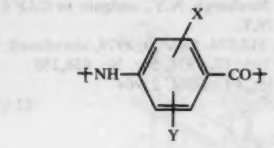
Continuation-in-part of Ser. No. 536,256, Dec. 24, 1974, Pat. No. 3,966,686. This application Apr. 19, 1976, Ser. No. 678,365

Claims priority, application Japan, Dec. 28, 1973, 49-1682

Int. Cl.[2] H01F *10/04;* **G11B** *5/78*

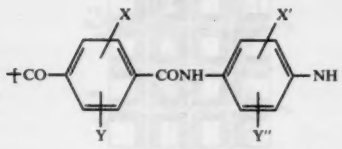
U.S. Cl. 428—474 **19 Claims**

1. Magnetic recording medium comprising a layer of magnetizable material and a flexible support material prepared from a high molecular weight p-oriented polycarbonamide consisting of at least about 70 mole % of recurring units of a formula selected from the group consisting of:



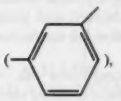
(I)

and



(II)

and mixtures thereof, wherein: X, Y, X' and Y' are monovalent radicals attached to a nuclear carbon and are selected from the group consisting of hydrogen, halogen, nitro and alkyl and alkoxy having from 1 to 3 carbon atoms, 0–30 mole % of other copolymeric units whenever present constituting such recurring units as m-phenylene



urethane (—NHCOO—), urea (—NHCONH—), ester (—COO—), hydrazide (—CONHNH—), ether (—O—), and aliphatic hydrocarbon groups (C_1–C_3),

said flexible material having a tensile modulus in excess of 800 kg/mm^2 and up to 20,000 kg/mm^2 at least in one direction, a water adsorption of less than 2.0 wt. % at 25° C and 75% relative humidity and a hydroscopic linear expansion coefficient of less than 1.0×10^{-5} mm/mm/% at least in one direction.

4,112,188

RESOLE RESIN BINDER COMPOSITION

Ronald H. Dahms, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 634,572, Nov. 24, 1975, Pat. No. 4,045,398. This application Feb. 14, 1977, Ser. No. 768,304

Int. Cl.[2] B32B *17/04, 27/42*

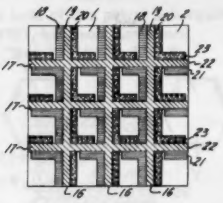
U.S. Cl. 428—436 **10 Claims**

1. A laminate comprising, a substrate sheet structure of fibers selected from the group consisting of cellulosic, asbestos, glass, synthetic and cellulosic modified with a synthetic, said substrate being impregnated and bonded with about 15 to 65 weight percent of a cured resole resin solids containing about 1 to 30 parts by weight of a boron compound accelerator based on 100 parts of said resole resin solids, the remainder, up to 100% by weight of said laminate being substrate, said boron compound being selected from the group consisting of boric acid, diammonium tetraborate, diammonium octaborate, diammonium pentaborate and mixtures thereof.

4,112,189
PROCESS FOR MULTI-COLOR VALLEY PRINTING AND EMBOSSING OF FLOORING MATERIAL AND THE LIKE AND FLOORING MATERIAL MADE BY SAID PROCESS

Bruce J. Terwilliger, Newburgh, N.Y., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 513,574, Oct. 10, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,230
Int. Cl.[2] D06C *23/04*
U.S. Cl. 428—443 12 Claims



1. A multicolor valley printed and embossed flooring material made according to the process comprising the steps of:
applying a first color ink to the surface of a first rotatable pattern roll;
transferring said first color ink from the first pattern roll to discrete surface areas of a single rotatable embossing and printing roll having a raised surface contour representing a pattern to be embossed and valley printed;
applying a second color ink to the surface of a second rotatable pattern roll;
transferring said second color ink from the second pattern roll to discrete surface areas of the embossing and printing roll not containing the first color ink and as well as other discrete surface areas thereof containing the first color ink;
advancing a single sheet of flooring material once through a nip defined by the embossing and printing roll and a rotatable backing roll; and
embossing the flooring material in the nip under the pressure of the embossing and printing roll, and simultaneously valley printing said flooring material with a first color in the areas thereof contacted by the surface of the embossing and printing roll containing the first color ink, with a second color in the areas thereof contacted by the surface of the embossing, and printing roll containing the second color ink, and with a third color derived from blending the first and second color inks under the pressure of the embossing and printing roll in the areas of the flooring material contacted by the surface of the embossing and printing roll containing the overlapping layers of first and second color inks.

4,112,190
METALLIZED PLASTIC MOLDING

Mitsuo Sato; Norio Miyagawa, both of Nagoya, and Juichi Kobayashi, Aichi, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1977, Ser. No. 807,149
Claims priority, application Japan, Jun. 21, 1976, 51-73628
Int. Cl.[2] B32B *15/08, 27/00*
U.S. Cl. 428—457 5 Claims

1. A metallized plastic molding, which comprises: (a) a plastic substrate, (b) a primer layer having a gel percentage of at least 80% and a swelling degree of not more than 20%, which is formed by curing a deposited primer forming material which comprises a mixture of a compound (A) having a molecular weight of at least 150 and less than 450 and containing at least two polymerizable unsaturated groups in one molecule and a compound (B) having a molecular weight of 450–2000 and containing at least two polymerizable unsaturated groups in one molecule in a weight ratio (A)/(B) of 1/9-9/1, on a surface of said substrate and (C) a metallic film on said primer layer.

4,112,191
DETOXIFICATION OF LEAD PAINT

William S. Anderson, Sunnyvale, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 31, 1977, Ser. No. 802,110
Int. Cl.[2] C07C *155/06;* B05D *3/10;* B32B *9/00*
U.S. Cl. 428—497 8 Claims

3. A composition of matter consisting of a film forming binder having dispersed therein a material selected from the group consisting of the alkali metal and alkaline earth metal salts of dithiocarbamates of multifunctional amines, said binder being non-toxic and capable of releasing said material in a mammalian stomach after ingestion and said material being:
(a) non-toxic;
(b) stable under the ambient conditions of temperature, humidity and light; and
(c) capable of forming a lead precipitate which is non-toxic, substantially insoluble in body fluids and capable of passing through the stomach and intestinal tract of a mammalian subject without measurable absorption in the bloodstream.

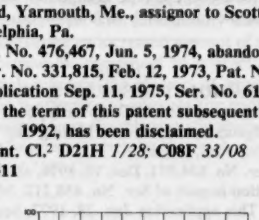
7. Tetrasodium pentaerythrityl tetrakis (dithiocarbamate).

8. Dizinc pentaerythrityl tetrakis (dithiocarbamate).

4,112,192
METHOD OF FINISHING COATED PAPER

Jay H. Vreeland, Yarmouth, Me., assignor to Scott Paper Company, Philadelphia, Pa.

Division of Ser. No. 476,467, Jun. 5, 1974, abandoned, which is a division of Ser. No. 331,815, Feb. 12, 1973, Pat. No. 3,873,345.
This application Sep. 11, 1975, Ser. No. 612,440
The portion of the term of this patent subsequent to Mar. 25, 1992, has been disclaimed.
Int. Cl.[2] D21H *1/28;* C08F *33/08*
U.S. Cl. 428—511 6 Claims

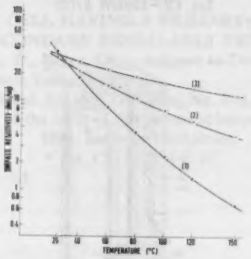


1. A dried, coated paper web for finishing by calender means to produce high-gloss coated paper which comprises a paper web coated on at least one side with a paper coating pigment and sufficient binder to bind the pigment when the binder has been coalesced, said binder consisting essentially of a hard thermoplastic polymer which is substantially uncoalesced and thereby the pigment unbonded and moldable.

4,112,193
ELECTRICAL INSULATORS

Noboru Higuchi, Nagoya; Takayuki Ogasawara, Konan, and Shoji Seike, Nagoya, all of Japan, assignors to Nippon Gaishi Kabushiki Kaishi, Nagoya, Japan

Filed Aug. 3, 1976, Ser. No. 711,165
Claims priority, application United Kingdom, Nov. 11, 1975, 46558/75
Int. Cl.[2] H01B *3/10, 3/12*
U.S. Cl. 428—539 3 Claims



1. An electrical insulator coated on its entire surface with a semi-conducting tin oxide system glaze comprising a tin oxide-antimony oxide mixture, wherein the glaze layer contains 0.05 to 10 percent by weight of at least one metal oxide selected from the group consisting of niobium oxide, tantalum oxide, titanium oxide, zirconium oxide, yttrium oxide and tungsten oxide.

4,112,194
HEXAGONAL HAFNIUM, ZIRCONIUM PHOSPHATE LUMINESCENT MATERIAL, METHOD OF PREPARATION, AND X-RAY INTENSIFYING SCREEN CONTAINING THE SAME

Charles Frederic Chenot, Towanda; James Evan Mathers, Ulster, and Francis Nathan Shaffer, Towanda, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 8, 1976, Ser. No. 739,577
Int. Cl.[2] C09K *11/42*
U.S. Cl. 428—539 8 Claims

1. A luminescent material with hexagonal crystal structure consisting essentially of large single crystalline particles of $(Hf_{1-x}Zr_x)_{3-y}A_{4y}(PO_4)_6$; where x is within the range of about 0.005 to 0.5, A is at least one alkali metal selected from the group consisting of lithium, sodium and potassium and y is within the range of 0.4 to 2.0.

4,112,195
LAMINABLE CONVERTIBLE MOLDING FOR HAND RAILS AND THE LIKE

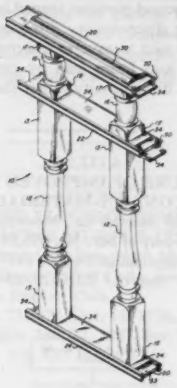
Ronald W. Pott, 730 Crescent Lane, Lakewood, Colo. 80215, and William G. Grimm, 29974 Paintbrush Dr., Evergreen, Colo. 80439

Filed Aug. 30, 1976, Ser. No. 718,963
Int. Cl.[2] B32B *3/00, 9/04*
U.S. Cl. 428—542 12 Claims

1. In a composite molding,

a plurality of interchangeable elongated body members of selected geometric shapes and scale dimensions laminated together, each member including a distinctive ornamental lateral edge, and interfitting means on both its upper and lower surfaces for mating engagement between adjacent body members defined by complementary laterally spaced pairs of ribs disposed in mutually confronting relation to one another with channels between respective pairs of said ribs, wherein said ribs on one body member are received within the channel in an adjacent body member to inhibit lateral movement of one body member in relation to the other,

an elongated cap member retained within and partially concealed by said interfitting means of one of said body members; and

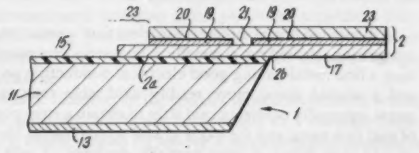


fastening means for securing said elongated body members and elongated cap in laminar relation to one another whereby to form an assembly having the external appearance and characteristics of an ornamental and functional unitary molding.

4,112,196
BEAM LEAD ARRANGEMENT FOR MICROELECTRONIC DEVICES

Thomas R. Selig, Kingston; Tugrul Yasar, Woodstock, and Derek A. Coulton, Poughkeepsie, all of N.Y., assignors to National Micronetics, Inc., Hurley, N.Y.

Filed Jan. 24, 1977, Ser. No. 762,005
Int. Cl.[2] H01C *17/28;* H01L *23/48, 23/50, 23/54*
U.S. Cl. 428—594 5 Claims



1. In combination in a microelectronic device, a chip and at least one beam lead affixed to said chip, said beam lead being characterized by an axial direction and a transverse direction substantially orthogonal to said axial direction, said beam lead comprising a laminate including an adhesive layer affixed to said chip, an intermediate barrier layer, and a beam layer disposed on the side of said barrier layer opposite to said adhesive layer, said beam lead having an axial extent in its said axial direction partly overlapping said chip and partly extending beyond the periphery of said chip, wherein said barrier layer includes an intermediate discontinuity therein extending in said transverse direction, said barrier layer including first and second portions spaced in said axial direction by said intermediate discontinuity, whereby said transverse discontinuity increases the peel resistance of said beam lead by permitting beam lead bending about said discontinuity rather than lead-chip separation.

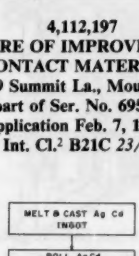
4. In combination with a microelectronic device, a chip and at least one beam lead affixed to said chip, said beam lead comprising a laminate including an adhesive layer affixed to said chip, an intermediate barrier layer, and a beam layer dis-

posed on a side of said barrier layer opposite to said adhesive layer, said beam lead having an axial extent partly overlapping said chip and partly extending beyond the periphery of said chip, wherein said adhesive layer includes an intermediate discontinuity therein extending in a direction transverse to the axial extent of said beam lead, wherein said adhesive layer includes first and second portions spaced in said axial direction by an intermediate discontinuity disposed in said transverse direction, whereby said transverse discontinuity increases the peel resistance of said beam lead by permitting beam lead bending about said discontinuity rather than lead-chip separation.

4,112,197
MANUFACTURE OF IMPROVED ELECTRICAL CONTACT MATERIALS

W. Peter Metz, 1309 Summit La., Mountainside, N.J. 07092

Continuation-in-part of Ser. No. 695,971, Jun. 14, 1976, abandoned. This application Feb. 7, 1977, Ser. No. 766,077
Int. Cl.[2] B21C *23/30*
U.S. Cl. 428—629 **37 Claims**


MELT & CAST Ag Cd INGOT
ROLL AgCd TO THICKNESS .100"-.001"
CLEAN STRIP IF REQUIRED
INTERNALLY OXIDIZE STRIP
ROLL OXIDIZE STRIP IF REQUIRED
CLEAN STRIP IF REQUIRED
WIND COIL FOR MECHANICAL ELONGATION
MECHANICALLY ELONGATE
SHAPE TO FINAL SIZE

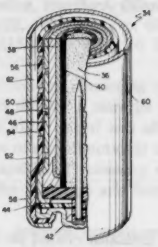
1. A method for manufacturing electrical contact materials comprising, providing a metallic alloy strip composed of at least a first metal having good electrical conductive properties and a second metal more readily oxidizable than said first metal, internally oxidizing said strip to obtain a strip composed of said first metal and the oxide of said second metal, the center of said strip being at least partially depleted of said second metal during internal oxidation and being substantially devoid of metal oxide to provide a depletion zone composed substantially of said first material and adjacent zones of metal oxide, said depletion zone being more readily deformable than the adjacent zones of metal oxide, winding said strip to form a wrapped billet, and mechanically elongating said wrapped billet to provide a ductile metal-metal oxide product having depletion zones alternating with zones of metal oxide, which depletion zones are disposed symmetrically about the longitudinal axis of said wrapped billet so that said product will deform symmetrically about said axis when headed in the direction normal to said axis.

20. An improved electrical contact material comprising a mechanically elongated billet composed of at least a first metal comprising silver and the oxide of a second metal, said billet including a plurality of alternating first and second zones, said zones extending the entire length of said billet and being substantially symmetrical and coaxial about the longitudinal axis of said billet, said first zones being substantially devoid of metal oxide and said second zones being substantially composed of metal-metal oxide, and said first zones are more readily deformable than said second zones so that said billet will deform symmetrically about its longitudinal axis when headed in the direction normal to said axis.

4,112,198
METAL-AIR DEPOLARIZED CELL WITH RESTRICTED WATER VAPOR ACCESS

Franciszek J. Przybyla, and Michael J. Smith, both of Mississauga, Canada, assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Sep. 28, 1977, Ser. No. 837,478
Int. Cl.[2] H01M *8/00*
U.S. Cl. 429—27 **9 Claims**

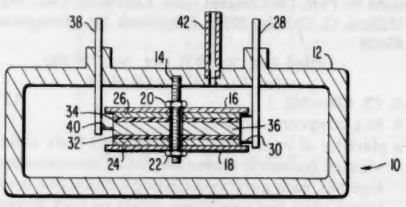


1. In a gas-depolarizable galvanic cell having an anode, a gas-depolarizable cathode, an electrolyte carrying separator therebetween, and a container for said cell having negative and positive terminals electrically insulated from each other and electrically associated with said anode and cathode, respectively, and wherein there is at least one opening in said container for gas communication from the exterior of the cell to said gas-depolarizable cathode, the improvement comprising a gas and moisture impermeable barrier interposed in the path of said gas communication to said cathode, said barrier having at least one opening therein and being interposed in said gas communication path in such a manner that the gas communication past said barrier is at a lower gas flow rate than the otherwise unrestricted gas flow rate permissible through said at least one opening in said container.

4,112,199
LANTHANUM NICKEL HYDRIDE-HYDROGEN/METAL OXIDE CELL

James D. Dunlop, Gaithersburg, and Joseph Stockel, Rockville, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Continuation of Ser. No. 645,504, Dec. 30, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,158
Int. Cl.[2] H01M *4/00*
U.S. Cl. 429—29 **8 Claims**



1. In a rechargeable metal oxide power cell of the type comprising a sealed container, said container including therein positive electrode means having a reoxidizable oxidizing agent therein, an electrolyte, and negative electrode means having catalyst capable of dissociating molecular hydrogen to mon-

atomic hydrogen and a binder disposed thereon wherein the improvement comprises:

said catalyst of said negative electrode means comprising an unalloyed composition of $LaNi_5$ capable of absorbing or desorbing hydrogen within the negative electrode structure in response to changes in pressure in said cell, and said positive electrode means and said negative electrode means are plates stacked in said sealed container and separated from each other by insulating means.

4,112,200

GALVANIC CELL HAVING A PRIMARY RADIAL SEAL AND A SECONDARY RESEALABLE VENT CLOSURE

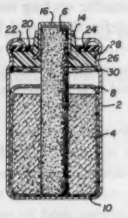
Henry Heinz, Jr., Berea, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,592

The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.

Int. Cl.[2] H01M *2/12*

U.S. Cl. 429—54 **15 Claims**



1. In a galvanic cell comprising a container having an open end and an inner disposed anode, a cathode within said container, a separator disposed between said anode and said cathode, an electrolyte disposed within said container, a cover for said container, and wherein an annular segment of the upper wall of the container and the cover is radially sealed with the rim of the container which extends beyond the radial seal turned over the top surface of the cover; the improvement wherein a resiliently compressible elastomeric sponge gasket is compressed between the top surface of the cover and the rim of the container which is turned over the cover.

4,112,201

POWER SOURCE UNIT

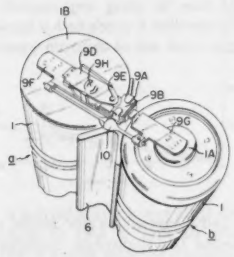
Kenichi Mabuchi, and Kogiro Komatsu, both of Tokyo, Japan, assignors to Mabuchi Motor Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1977, Ser. No. 787,088

Claims priority, application Japan, Apr. 19, 1976, 51-44227

Int. Cl.[2] H01M *10/50*

U.S. Cl. 429—62 **9 Claims**



1. A power source unit comprising battery rows consisting of a plurality of rapidly chargeable and dischargeable batteries having low internal resistance connected in series, disposed in parallel rows with separators in between, and packed into a unit, characterized in that the power source unit incorporates a thermal responsive device for stopping an electric current flowing in the batteries by means of changes in the state of the thermal responsive device when temperature in the batteries in the power source unit is increased during charging of the batteries, and for restricting the current to a predetermined low level of current by means of changes in the state of the thermal responsive device when temperature in the batteries in the power source unit is increased during discharging of the batteries.

4,112,202

SPIRALLY WOUND ELECTROCHEMICAL CELL AND METHOD AND APPARATUS FOR ITS PRODUCTION

Leonard F. Hug, Wheatridge; Donald H. McClelland, Littleton, and Toshio Uba, Denver, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 733,674, Oct. 18, 1976, Pat. No. 4,064,725. This application Jun. 27, 1977, Ser. No. 810,336

Int. Cl.[2] H01M *6/10*

U.S. Cl. 429—94 **9 Claims**

1. A spirally wound element of nominal design outside diameter for use in an electrochemical cell comprising:

positive and negative flexible electrode plates interleaved with compressible separator layers, having a combined uncompressed nominal design thickness, the unwound and uncompressed thickness of the plates and separators combined being greater than one but less than about three percent away from the predetermined nominal design thickness;

the outside diameter of the spirally wound element, in which the separator layers are compressed to a reduced thickness, characterized by having a predetermined dimension within plus or minus one percent of the nominal design outside diameter.

4,112,203

ALKALI METAL/SULFUR BATTERY

Joginder N. Anand, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

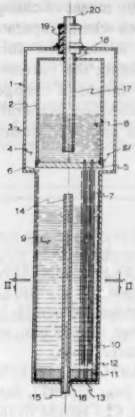
Continuation-in-part of Ser. No. 702,649, Jul. 6, 1976, abandoned. This application Apr. 21, 1977, Ser. No. 789,610

Int. Cl.[2] H01M *10/39*

U.S. Cl. 429—104 **11 Claims**

1. An alkali metal/sulfur battery cell in which the electrolyte/separator is in the form of a plurality of hollow fibers of such character as to be damaged if a catholyte consisting essentially of an alkali metal M and sulfur in an M/S atomic ratio within the range of from about 1/100 to about $\frac{1}{2}$ is allowed to solidify in the locus occupied by the catholyte during operation of said cell, said cell comprising means for emptying said locus of said molten catholyte and transferring it to a

different location wherein solidification of said catholyte will not damage the fibers, said cell being adapted to alternately be



charged and discharged without utilization of said transfer means during such operation.

4,112,204

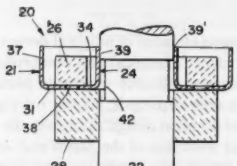
BATTERY TERMINAL SEAL STRUCTURE

Russell C. McRae, Los Altos, Calif., assignor to ILC Technology, Inc., Sunnyvale, Calif.

Filed Feb. 22, 1977, Ser. No. 770,300

Int. Cl.[2] H01M 2/30

U.S. Cl. 429—181 **8 Claims**



1. In a high electrical energy low voltage battery comprising a sealed metallic can containing positive and negative electrodes and an electrical terminal hermetically sealed through said can and electrically connected to one of said electrodes the improvement wherein said electrical terminal comprises:

(a) a first metallic sealing member having a first portion defining an annulus of given internal diameter, given external diameter and opposite substantially parallel surfaces and a second portion defining a right circular cylinder at the external periphery of said annulus defined by said first portion of said first metallic sealing member;

(b) a second metallic sealing member having a first portion defining an annulus with opposite parallel surfaces having a given internal diameter and a given external diameter smaller than said given internal diameter of said annulus defined by said first portion of said first metallic sealing member and a second portion defining a right circular cylinder at the internal periphery thereof;

(c) a first annular ceramic member having an internal diameter smaller than said given external diameter and larger than said given internal diameter of said annulus defined by said first portion of said second metallic sealing member and an external diameter larger than said given internal diameter of said annulus defined by said first portion of said first metallic sealing member;

(d) a second annular ceramic member having an internal diameter smaller than said given internal and external diameters of said annulus defined by said first portion of said second metallic sealing member and an external diameter larger than said given internal diameter of said annulus defined by said first portion of said first metallic sealing member;

(e) ceramic of metal seals bonding each of said opposite parallel surfaces of said annulus defined by said first portion of said first metallic sealing member to a different one of said first and second annular ceramic members;

(f) ceramic to metal seals bonding each of said opposite parallel surfaces of said annulus defined by said first portion of said second metallic sealing member to a different one of said first and second annular ceramic members with said first annular ceramic member surrounding said right circular cylinder defined at the internal periphery of said second metallic sealing member in radially spaced relation thereto and with said annulus defined by said first portion of said second metallic sealing member in coaxial relation to said annulus defined by said first portion of said first metallic sealing member whereby said external and internal diameters respectively thereof are spaced from each other between said first and second annular ceramic members; and

(g) a solid metallic rod received with said right circular cylinder defined by said second portion of said second metallic sealing member and hermetically bonded thereto, said internal diameter of said second annular ceramic member being dimensioned to receive said solid metallic rod with a small tolerance.

4,112,205

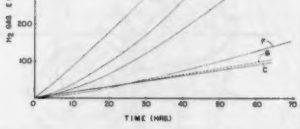
BATTERY ELECTROLYTE CORROSION INHIBITOR

John C. Charkoudian, Cambridge, and Arnold Hoffman, Brookline, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1974, Ser. No. 536,432

Int. Cl.[2] H01M 6/04

U.S. Cl. 429—199 **11 Claims**



1. A galvanic cell comprising a zinc anode, a cathode and an electrolyte, wherein the electrolyte contains as a corrosion inhibitor a double salt of the formula:

$$M\,Hg_x\,Cl_y$$

wherein M is a quaternary cation, x is 1, 2 or 3, and y is 3 to 8.

4,112,206

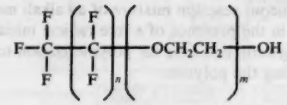
POLYVINYL CHLORIDE HAVING IMPROVED ANTISTATIC PROPERTIES

James A. Wingrave, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jul. 5, 1977, Ser. No. 812,555
Int. Cl.[2] C08F 6/00
U.S. Cl. 526—3 5 Claims

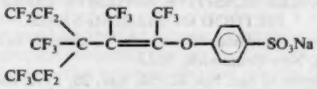
1. An improvement in the method of providing antistatic properties in polyvinyl chloride by chemical treatment the improvement comprising adding to the polyvinyl chloride an effective amount, in the range of about 0.0002 to about 0.02 weight percent based on said polyvinyl chloride, of a fluorocarbon surfactant selected from the group consisting of:

(a) fluorinated alkyl polyoxyethylene ethanols represented by the formula



wherein n is in the range of 8 to 18 and m is in the range of 1 to 5, and

(b) a compound represented by the formula



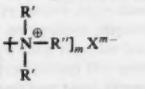
4,112,207

RADIATION-CURABLE POLYMERS BEARING QUATERNARY NITROGEN GROUPS

Giffin D. Jones, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

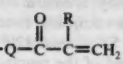
Filed Oct. 29, 1976, Ser. No. 737,240
Int. Cl.[2] C08F 8/32, 8/30
U.S. Cl. 526—17 16 Claims

1. A radiation-curable polymer which is soluble in water or in dilute aqueous alcohol solutions and which comprises a base polymer (a) which base polymer has a weight average molecular weight of from about 5,000 to about 50,000 and comprises an olefin monomer addition polymerized with an active halogen monomer wherein the active halogen monomer is an addition polymerizable ethylenically unsaturated monomer which, after polymerization, provides a pendant halomethyl group capable of being aminated by a tertiary amine and (b) which base polymer has pendantly bonded thereto at least about 1.0 milliequivalent of a polymerizable or non-polymerizable quaternary nitrogen moiety per gram of said radiation-curable polymer, with the proviso that said base polymer has pendantly bonded thereto, per gram of said radiation-curable polymer, from about 0.4 to about 3 milliequivalents of a polymerizable quaternary nitrogen in the form of a moiety of the formula



(III)

wherein each R′ is individually a lower alkyl radical or a lower hydroxyalkyl radical or two R′ radicals collectively are a divalent radical that is joined with the nitrogen atom to form a 5 or 6 membered heterocyclic ring which may contain an atom of oxygen non-adjacent to the nitrogen atom; each R″ is individually a lower alkyl radical, a lower hydroxyalkyl radical or an unsaturated organic radical of the formula



wherein R is hydrogen or methyl and Q is a divalent aliphatic radical; X is a neutralizing inorganic anion, a neutralizing saturated organic anion, or a neutralizing organic anion containing acryloyl unsaturation; and m is 1 or 2; with the proviso that either R″ is said unsaturated organic radical or X is said neutralizing organic anion containing acryloyl unsaturation.

4,112,208

PEROXIDE TREATED SUBSTANTIALLY AMORPHOUS POLYOLEFINS USEFUL AS PRESSURE-SENSITIVE ADHESIVES

Richard L. McConnell, Kingsport, and Doyle A. Weemes, Greeneville, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 6, 1977, Ser. No. 813,375
Int. Cl.[2] C08F 8/06
U.S. Cl. 526—57 12 Claims

1. A process for preparing tacky modified amorphous polyolefin compositions useful as pressure sensitive adhesives which comprises reacting substantially amorphous polyolefin selected from the group consisting of substantially amorphous homopolymers of 1-olefins containing 3 to 5 carbon atoms, substantially amorphous copolymers prepared from either ethylene and 1-olefins containing 3 to 5 carbon atoms or propylene and 1-butene, and substantially amorphous propylene or 1-butene/higher 1-olefin copolymers containing less than 40 mole percent of at least one higher 1-olefin of the group consisting essentially of 1-hexene, 1-heptene, 1-octene, 1-nonene, and 1-decene having a melt viscosity of about 100 to 200,000 at 190° C. with about 2 to 25 weight percent of at least one peroxide selected from the group consisting of ditertiarybutyl peroxide, 2,5-dimethyl-2,5-di(tertiarybutylperoxy)hexane, dicumyl peroxide, and cumene hydroperoxide at a temperature of 150° to 250° C. to provide a low viscosity, permanently tacky hot-melt pressure sensitive adhesive.

4,112,209

PROCESS FOR MAKING POLYSTYRENE

Jeffrey A. Gunsher, Midland; Joseph L. Garner, Sanford, both of Mich., and Conrad O. M. Miller, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 715,585, Aug. 18, 1976, abandoned. This application Jun. 30, 1977, Ser. No. 811,511
Int. Cl.[2] C08F 4/14
U.S. Cl. 526—65 12 Claims

1. A continuous process for making a polystyrene having a $\overline{M}_w$ between about 200 and about 1,000 and a $\overline{M}_w/\overline{M}_n$ ratio of less than about 8 comprising contacting, in 2 or more stages, a solution of styrene monomer in a first inert organic diluent with a cation generator, under substantially isothermal conditions in each stage, at a temperature between about 90° C and about 180° C in a manner such that said styrene monomer, prior to the final stage, is always present in greater than a stoichiometric amount with respect to said cation generator.

4,112,210

POLYMERIZATION PROCESS

Yves deZarauz, Le Cendre, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation-in-part of Ser. No. 659,905, Feb. 20, 1976, abandoned. This application Apr. 15, 1977, Ser. No. 788,031
Claims priority, application France, Feb. 27, 1975, 75 06239
Int. Cl.[2] C08F 4/46, 4/56
U.S. Cl. 526—187 10 Claims

1. A process of producing homopolymers of conjugated dienes or copolymers of conjugated dienes with other conju-

gated dienes or with vinyl aromatic compounds to form elastomeric products which comprises reacting the monomers at a temperature between 50° C. and 120° C. in the presence of a catalytic system formed of the reaction product of

(a) an organometallic compound of a metal of Group IIIA of the Mendeleev periodic table of elements having the following formula: $Me^2(Me^3R^1R^2R^3R^4)_2$ in which Me^2 represents an alkaline earth metal, Me^3 represents aluminum or boron, R^1, R^2, and R^3 represent an alkyl or aralkyl radical and R^4 represents an alkyl or aralkyl radical or a radical XB in which X represents an oxygen, sulfur or nitrogen atom and B represents an alkyl or aralkyl radical; with

(b) at least one electron-donor compound containing at least one hetero-atom and formed of the reaction product of a protic polar compound with an alkali metal or with an alkaline earth metal.

4,112,211

PROCESS FOR THE MANUFACTURE OF HOMO- AND COPOLYMERS OF TETRAFLUOROETHYLENE EMPLOYING AS THE REDUCING AGENT IN THE REDOX CATALYST AN AYODICARBOXYLIC ACID, SALT OF AYOCARBOXYLIC ACID, AZODICARBONAMIDE, OR MIXTURES THEREOF

Jürgen Kuhls, Burghausen, Salzach; Alfred Steininger, and Herbert Fitz, both of Burgkirchen, Alz, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 20, 1976, Ser. No. 688,429

Claims priority, application Fed. Rep. of Germany, May 28, 1975, 2523570

Int. Cl.[2] C08F *4/04, 4/40, 14/18, 114/18*

U.S. Cl. 526—219 **4 Claims**

1. In the process for homopolymerizing tetrafluoroethylene or copolymerizing tetrafluoroethylene with other fluoroolefins by the suspension or emulsion process at the usual pressures and temperatures, in the presence of a redox catalyst system consisting of a known peroxidic oxidizing component and a reducing component, the improvement which comprises using as reducing component of the redox system a member selected from the group consisting of azodicarboxylic acid, a salt of azodicarboxylic acid, azodicarbonamide, and mixtures thereof.

4,112,212

ULTRA-HIGH MOLECULAR WEIGHT POLYMETHACRYLOYLOXYBENZOIC ACID AND METHOD OF PREPARATION

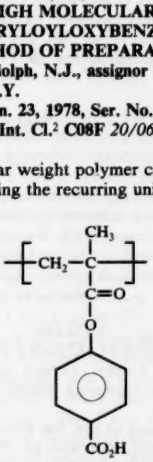
Eui Won Choe, Randolph, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 23, 1978, Ser. No. 871,282

Int. Cl.[2] C08F *20/06*

U.S. Cl. 526—234 **10 Claims**

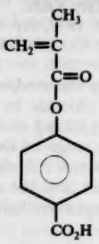
1. A high molecular weight polymer capable of forming an anisotropic melt having the recurring unit:



said polymer having an inherent viscosity of at least about 1.0 dl/g when measured as a 0.2% by weight solution in 2N NaOH at 25° C.

3. An improved process for preparing a high molecular weight polymer capable of forming an anisotropic melt comprising:

a. dissolving a monomer having the formula



in an aqueous reaction mixture of an alkali metal hydroxide and in the presence of a free radical initiator,

b. allowing sufficient time for polymerization to occur, and

c. recovering the polymer.

4,112,213

PRESSURE SENSITIVE ADHESIVE TAPES AND METHOD OF MAKING SAME

Harold Louis Waldman, Monsey, N.Y., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 32,756, Apr. 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 399,837, Sep. 28, 1964, abandoned. This application Jun. 3, 1974, Ser. No. 475,707

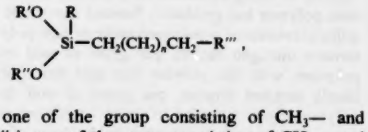
Int. Cl.[2] C08F *220/12*

U.S. Cl. 526—279 **13 Claims**

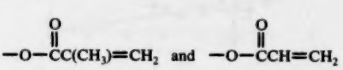
1. The method of making pressure sensitive adhesive coated articles having acrylate pressure sensitive adhesive coatings of improved internal strength comprising spreading a solution of acrylate pressure sensitive adhesive polymer in organic solvent on a substrate, the acrylate polymer containing randomly interpolymerized therein:

(a) at least 60% by weight of an alkyl acrylate monomer in which the alkyl group has 4 to 12 carbons; and

(b) a monomer containing an alkoxy silyl alkyl group, said alkoxy silyl alkyl group-containing monomer being present in an amount sufficient to provide from 0.01% to 1.0% by weight of the acrylate polymer of said alkoxy silyl alkyl groups, said alkoxy silyl alkyl group-containing monomer having the general formula



where R′ is one of the group consisting of CH_3— and CH_3CH_2—, R″ is one of the group consisting of CH_3— and CH_3CH_2—, R is one of the group consisting of CH_3—, CH_3CH_2—, CH_3O—, and CH_3CH_2O—, R‴ is one of the group consisting of

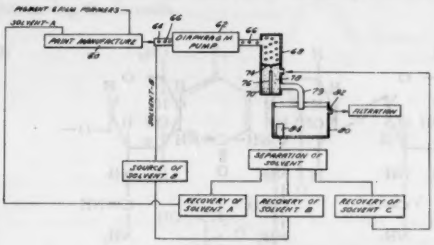


and *n* is a number selected from the group consisting of 0 and the integers 1 through 8, said alkoxy silyl alkyl group-containing monomer being interpolymerized in said polymer through its ethylenically unsaturated double bond; evaporating off the solvent and heating the coating of pressure sensitive adhesive to crosslink the same.

4,112,214
METHOD OF PREPARING POWDER PARTICLES BY CONTROL OF THE PARTICLE SHAPE

Ivan H. Tsou, Bloomfield Hills, Mich., assignor to Grow Chemical Corp., New York, N.Y.

Continuation of Ser. No. 557,538, Mar. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 460,109, Apr. 11, 1974, abandoned. This application Dec. 3, 1976, Ser. No. 747,221
Int. Cl.[2] C08F 6/12
U.S. Cl. 528—494 10 Claims



1. A process for preparing powder paint particles having a desired particle shape comprising the steps of:

providing a pigmented solution having a film forming portion comprised of polyvinyl chloride and a first liquid portion in which the film forming portion is soluble;

forming droplets containing the film forming portion and the first liquid portion by contacting the solution with a second liquid which is at least partially miscible with the first liquid and in which the film forming portion is nonsoluble, the second liquid being saturated with the first liquid, and providing further that the second liquid is a solution mixture of water saturated with the first liquid;

diluting said droplets with a quantity of water in which the film forming portion precipitates as particles, whereby the first liquid is removed from the droplets by the water, the quantity by weight of the water employed being at least five times that of the first liquid; and

controlling the shape of the powdered particles by regulating the dilution of the first liquids from the droplets.

4,112,215
COPOLYMERIC RESIN BINDER POWDERS

Hanns Boessler, Darmstadt, and Hubert Rauch, Weiterstadt, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Division of Ser. No. 603,608, Aug. 11, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,290
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1975, 2512238
Int. Cl.[2] C08F 6/22
U.S. Cl. 528—503 2 Claims

1. The method of making a copolymer powder having a residual monomer content therein of less than 0.05 percent by weight and having a primary particle size less than one micron in diameter, said powder being adaptable to rapid solution in an organic solvent to form a solution for coating a core comprising a therapeutically active ingredient, which method comprises spray drying an aqueous dispersion of copolymer particles at a temperature such that the temperature of the copolymer particles does not exceed the minimum film-forming temperature of the copolymer, said dispersion being prepared by the aqueous emulsion polymerization of monomers to give particles of a size less than one micron in diameter of a physiologically tolerable copolymer comprising

(a) 5 to 80 percent by weight of a water-soluble monomer selected from the group consisting of α,β-unsaturated mono- and dicarboxylic acids, acrylamide, methacrylamide, hydroxy lower alkyl esters of acrylic acid and methacrylic acid, monoalkyl- and dialkyl-amino lower alkyl esters of acrylic acid and methacrylic acid, quaternary ammonium salts of such amino lower alkyl acrylates and methacrylates, vinyl pyrrolidone, and vinyl imidazole; and

(b) 95 to 20 percent by weight of a monomer selected from the group consisting of styrene, vinyl acetate, and alkyl esters of acrylic acid and methacrylic acid having 1 to 10 carbon atoms in the alkyl portion thereof;

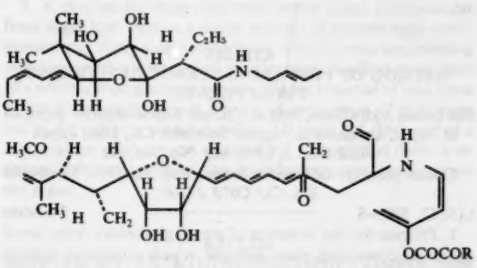
the relative amounts of monomers (a) and (b) in said copolymer being such that the minimum film-forming temperature thereof is greater than 80° C., said copolymer further being water-insoluble in one portion of the region between pH 1.5 and pH 8 and water-soluble or water-swellable in another portion of said region.

4,112,216
CONVERSION OF MOCIMYCIN TO ANTIBIOTIC X-5108 AND INTERMEDIATES

Hubert Maehr, Belleville, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 506,156, Sep. 16, 1974, abandoned. This application Dec. 10, 1976, Ser. No. 749,485
Int. Cl.[2] C07H 3/08
U.S. Cl. 536—1 6 Claims

1. A compound of the formula



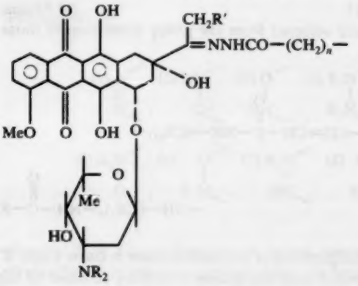
wherein R is selected from the group consisting of lower alkoxy, lower alkyl, phenoxy, phenyl and lower alkyl phenyl and halo phenyl.

4,112,217
BIS-HYDRAZONES OF DAUNOMYCIN AND ADRIAMYCIN

David W. Henry, Chapel Hill, N.C., and George L. Tong, Cupertino, Calif., assignors to SRI International, Menlo Park, Calif.

Filed Sep. 2, 1977, Ser. No. 830,091
Int. Cl.[2] C07G 3/00
U.S. Cl. 536—4 11 Claims

1. Compounds having the structure



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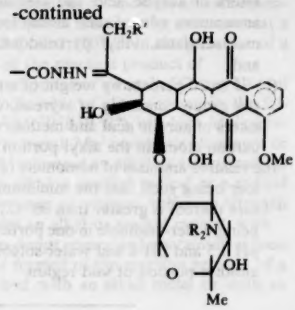


wherein *n* is an integer having a value of from 0 through 8 and the radicals indicated by R and R′ each represent hydrogen except that in those instances in which *n* has a value of 2, the R groups, if not hydrogen, may be methyl radicals (with R′ remaining as hydrogen), and the R′ groups, if not hydrogen, may be hydroxy radicals (with R remaining as hydrogen), together with their pharmaceutically acceptable acid addition salts.

4,112,218

METHOD OF PREPARING STEROL GLYCOSIDES FROM PLANTS

Sho Inoue; Akira Sano, both of Uji, and Koji Kitaguchi, Joyo, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Filed Dec. 2, 1976, Ser. No. 746,940
Claims priority, application Japan, Aug. 31, 1976, 51-104656
Int. Cl.[2] C07J *17/00*
U.S. Cl. 536—5 **7 Claims**

1. Process for the isolation of sterol glycosides from sterol glycoside-containing plant material which comprises heating said material in alkaline lower alkanol at temperatures up to the boiling point of said alkanol together with an alkali metal salt selected from the group consisting of carbonate, bicarbonate and nitrate, separating the solid which forms and removing the alkali metal salt and any other inorganics from said solid by washing with water.

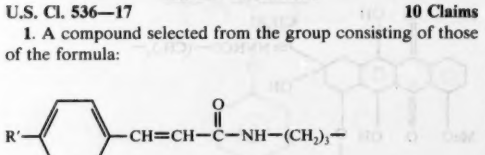
4,112,219

ACYL DERIVATIVES OF ANTIBIOTIC BM123γ

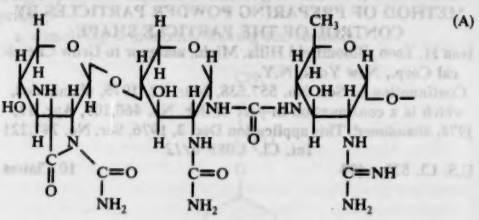
Joseph John Hlavka, Tuxedo Park, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 13, 1977, Ser. No. 815,340
Int. Cl.[2] C07H *13/12*
U.S. Cl. 536—17 **10 Claims**

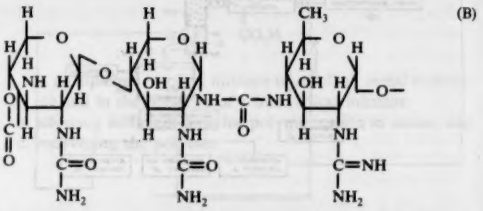
1. A compound selected from the group consisting of those of the formula:



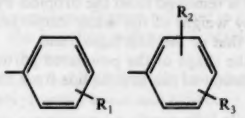
wherein the configuration of the double bond is cis or trans; R′ is a moiety selected from the group consisting of those of the formulae:



and



and R is selected from the group consisting of hydrogen, lower alkyl, halo-substituted lower alkyl, straight chain alkyl having from 5 to 9 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, phenoxy-substituted lower alkyl, lower carboalkoxy, lower alkoxymethyl, styryl, pentachlorophenyl, pentafluorophenyl, 2,3,6-trichlorophenyl, 3,4,5-trimethoxyphenyl, 4-carbethoxy-3,5-dimethoxyphenyl, 1-naphthyl, 4-fluoro-1-naphthyl, 8-bromo-1-naphthyl, 2-naphthyl, 3-methoxy-2-naphthyl, 1-naphthyloxymethyl, 2-naphthyloxymethyl, trichloromethyl, chlorodiphenylmethyl, 2-pyridinyl-N-oxide, 2-thienyl, 2-furyl, 1,4-thiapyran-2-yl, 4-oxy-4H-thiapyran-3-yl, 4-ethyl-2,3-diketopiperazin-1-yl or moieties of the formulae:



wherein R_1 is hydrogen, fluoro, chloro, nitro, cyano, hydroxy, mercapto, formyl, trifluoromethyl, trifluoromethoxy, phenyl, phenoxy, benzyl, benzoyl, sulfamyl, 4-chlorophenylsulfonyl, lower alkyl, lower alkoxy, lower alkylthio, lower alkanoyloxy, lower alkanoylamino or di(lower akyl)-amino and R_2 and R_3 are the same and are fluoro, chloro, nitro, methyl or methoxy; and the pharmacologically acceptable acid-addition salts thereof.

4,112,220

NITRATE ESTERS OF GALACTOMANNAN GUMS AND METHODS FOR THEIR SYNTHESIS

William J. Carroll, Allentown, and George L. Griffith, Coopersburg, both of Pa., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Oct. 29, 1974, Ser. No. 518,664
Int. Cl.[2] C07G *3/00*; C08B *37/00*
U.S. Cl. 536—18 **9 Claims**

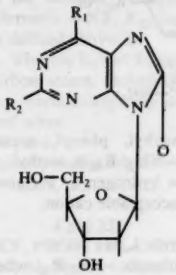
1. A nitrate ester of a galactomannan gum in which hydroxyl hydrogens of the galactomannan gum are replaced by nitro groups.

4,112,221
PROCESS FOR PREPARING 8,2'-O-ANHYDROPURINE NUCLEOSIDES

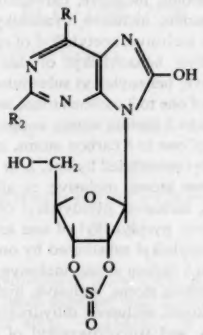
Kozo Tsunoda; Tsuneo Sowa, both of Nobeoka; Kunio Iitsuka, Fuji, and Kiyohide Sako, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1975, Ser. No. 594,829
Claims priority, application Japan, Jul. 17, 1974, 49-81171; Aug. 9, 1974, 49-90716
Int. Cl.[2] C07H *19/16*
U.S. Cl. 536—24 5 Claims

1. A process for preparing a 8,2'-O-anhydropurine nucleoside having the formula



wherein R_1 and R_2 individually represent a hydrogen atom, hydroxy group, amino group, mercapto group or a halogen atom which comprises heating at a temperature from about 80° to 160° C. a 2',3-O-sulfinyl-8-oxypurine nucleoside having the formula



wherein R_1 and R_2 are as defined above in an aprotic polar solvent in the presence of salt selected from the group consisting of sodium hydrogencarbonate, potassium hydrogencarbonate, potassium borate, barium borate, sodium hydrogensulfite, calcium sulfite, potassium phosphate, disodium hydrogenphosphate, sodium nitrite, sodium iodine, sodium acetate, ammonium acetate, lithium acetate, sodium formate, potassium propionate, calcium butyrate, sodium tartrate, barium tartrate, sodium adipate, potassium hydrogenglutamate, sodium citrate, potassium hydrogenphthalate, sodium benzoate, potassium benzoate, sodium p-aminobenzoate and potassium salicylate.

4,112,222
METHOD OF PREPARING HYDROXYPROPYLATED STARCH DERIVATIVES

Wadym Jarowenko, Plainfield, N.J., assignor to National Starch and Chemical Corp., Bridgewater, N.J.

Filed Jan. 7, 1977, Ser. No. 757,634
Int. Cl.[2] C08B *31/10;* C13L *1/08*
U.S. Cl. 536—111 24 Claims

1. In a method for producing a granular, cold-water dispersible hydroxypropylated starch ether which comprises reacting a granular starch base having a moisture content of 6–20% based on the weight of the starch with about 15–50% propylene oxide by weight, said reaction being carried out for about 4.5–24 hours at a temperature of about 70°–100° C. and at a pressure of about 10–100 p.s.i.g., the improvement comprising the steps of:

(a) impregnating said starch base with about 0.25–5.0%, based on the weight of the dry starch base, of a catalyst salt in aqueous solution form, said salt being a water-soluble alkali or alkali earth salt of a carboxylic acid which is unsubstituted or alkyl- or hydroxy-substituted, having no more than 20 carbon atoms in total, and, if aliphatic, having 1 to 6 carbon atoms in its primary carbon chain; and

(b) conducting said reaction in the presence of said salt.

4,112,223
REMOVAL OF TRACE HEAVY METAL CONTAMINANTS FROM ALGAE AND THE CARRAGEENAN CONTAINED THEREIN

Chii-Fa Lin, Tarrytown, N.Y., and Julian E. Blanch, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 538,624, Jan. 6, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,461
Int. Cl.[2] C08B *37/04*
U.S. Cl. 536—114 9 Claims

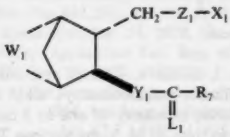
1. A process for removing trace heavy metal contaminants from algae that contain a major amount of lambda-type carrageenan and from said carrageenan which comprises treating said algae with a water solution containing an effective amount of a soluble food grade potassium salt for removal of said trace heavy metal contaminants using a concentration of potassium ion in the solution which is below 1.0 mole K^+/liter and at a temperature not in excess of about 10° C. such that there is no appreciable extraction of the lambda-type carrageenan from the algae.

4,112,224
BIHETEROCYCLIC-9,11-TRIDEOXY-PGF COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

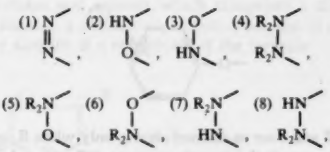
Continuation-in-part of Ser. No. 714,390, Aug. 16, 1976, abandoned, and Ser. No. 800,623, May 26, 1977, abandoned. This application Jun. 30, 1977, Ser. No. 810,811
Int. Cl.[2] C07D *231/04, 231/06, 261/02;* C01B *15/02*
U.S. Cl. 542—426 52 Claims

1. A prostaglandin analog of the formula



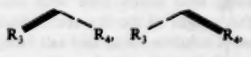
IV

wherein W_1 is

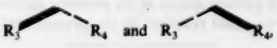


wherein R_2 is alkyl of one to 4 carbon atoms, inclusive or alkylcarbonyl of one to 4 carbon atoms, inclusive; wherein Y_1 is

(1) trans—CH=CH—CH_2—,
(2) —$(CH_2)_3$—,
(3) —C|C—CH_2—,
(4) trans—CH_2—CH=CH—,or
(5) cis—CH=CH—CH_2—
wherein L_1 is



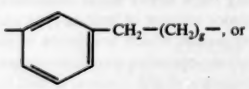
or a mixture of



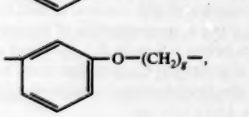
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the provisio that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; wherein Z_1 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,

(7)

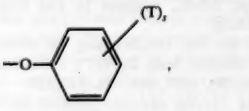


(8)

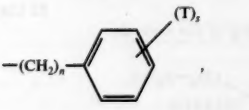


wherein g is one, 2, or 3; wherein R_7 is
(1) —$(CH_2)_m$—CH_3,

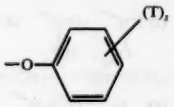
(2)



(3)

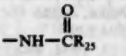


wherein h is zero to 3, inclusive, wherein m is one to 5, inclusive, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is

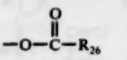


wherein T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different; wherein X_1 is
(1) —$COOR_1$ wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by

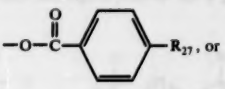
(a)



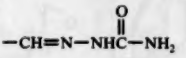
(b)



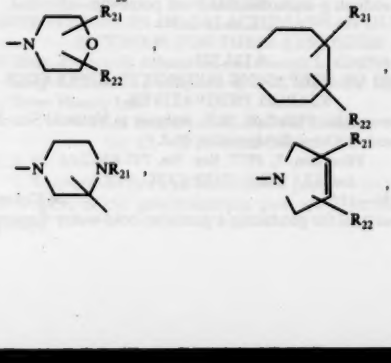
(c)



(d)



wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH_2; R_{26} is methyl, phenyl, —NH_2, or methoxy; and R_{27} is hydrogen or acetamido; inclusive, or a pharmacologically acceptable cation;
(2) —CH_2OH;
(3) —COL_4, wherein L_4 is
(a) amido of the formula —$NR_{21}R_{22}$, wherein R_{21} and R_{22} are hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl; phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro; carboxyalkyl of one to four carbon atoms, inclusive; carbamoylalkyl of one to four carbon atoms, inclusive; cyanoalkyl of one to four carbon atoms, inclusive, acetylalkyl of one to four carbon atoms, inclusive; benzoylalkyl of one to four carbon atoms, inclusive; benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; hydroxy, alkoxy of one to 3 carbon atoms, inclusive; carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive; or nitro; pyridyl; pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; or alkoxy of one to 3 carbon atoms, inclusive; pyridylalkyl of one to 4 carbon atoms, inclusive; pyridylalkyl of one to 4 carbon atoms, inclusive; pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; hydroxy, alkoxy of one to 3 carbon atoms, inclusive; hydroxyalkyl of one to 4 carbon atoms, inclusive; dihydroxyalkyl of one to 4 carbon atoms, and trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;
(b) cycloamido selected from the group consistng of



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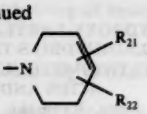
or



wherein R_{21} and R_{22} are as defined above;

(c) carbonylamido of the formula $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above;

(d) sulphonylamido of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above; or

(e) hydrazino of the formula $—NR_{23}R_{24}$, wherein R_{24} is amido of the formula $—NR_{21}R_{22}$, as defined above, or cycloamido, as defined above; or

(4) $—CH_2NL_2L_3$, wherein L_2 and L_3 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; or the pharmacologically acceptable acid addition salts thereof when

X_1 is not $—COOR_1$ and

R_1 a pharmacologically acceptable cation.

4,112,225

16-CF_3 PROSTAGLANDINS

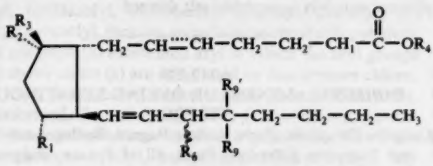
George William Holland, North Caldwell; Jane Liu Jernow, Verona, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 683,576, May 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 480,458, Jul. 18, 1974, Pat. No. 4,052,446, which is a continuation-in-part of Ser. No. 386,117, Aug. 6, 1973, abandoned. This application Dec. 8, 1976, Ser. No. 745,257

Int. Cl.² C07C *177/00*

U.S. Cl. 542—426 **11 Claims**

1. A compound of the formula:



wherein R_4 is hydrogen or lower alkyl; R_2 is hydroxy; R_3 is hydrogen or taken together with R_2 forms oxo; R_1 is hydrogen, lower alkyl, $—CH_2OR_1'$, or $—COOR_1'$; R_6 is hydroxy, lower alkanoyloxy, benzoyloxy, benzyloxy, benzhydryloxy, trityloxy, trialkylsilyloxy, tetrahydropyranyloxy, or 4-methoxy-5,6-dihydro-2H-pyranyloxy; R_1' is hydrogen, or lower alkyl; R_9' is hydrogen, lower alkyl or fluoro; R_9 is trifluoromethyl; and the dotted bond can be optionally hydrogenated

or enantiomers or racemates thereof.

4,112,226

PROCESS FOR REMOVING NON-FLUORESCENT TRIAZINE DERIVATIVE IMPURITIES FROM FLUORESCENT AGENTS

Philip Richard Norman Eymond, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

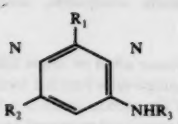
Filed Oct. 22, 1976, Ser. No. 734,686

Claims priority, application United Kingdom, Oct. 24, 1975, 43849/75

Int. Cl.² C07D *251/08*

U.S. Cl. 542—461 **6 Claims**

1. A process for removing non-fluorescent triazine derivative impurities having the structural formula:



wherein

R_1 is a hydroxy group or a halogen atom,

R_2 is a hydroxy group or the group—NR_4R_5, each of R_4 and R_5 being a hydrogen atom, alkyl, substituted alkyl, aryl or substituted aryl group, and R_3 is an alkyl, substituted alkyl, aryl or substituted aryl group,

from a fluorescent agent of

(a) 4,4-di(2″,4″-dianilinotriazin-6″-ylamino)-stilbene-2,2′-disulphonic acid or its salts,

(b) 4,4′-di(2″-anilino-4″-morpholinotriazin-6″-ylamino)-stilbene-2,2′-disulphonic acid or its salts,

(c) 4,4′-di(2″-anilino-4″-N-methylethanolamino-triazin-6″-ylamino)-stilbene-2,2′-disulphonic acid or its salts,

(d) 4,4′-di(2″-anilino-4″-diethanolaminotriazin-6″-ylamino)-stilbene-2,2′-disulphonic acid or its salts,

(e) 4,4′-di(2″-anilino-4″-dimethylaminotriazin-6″-ylamino)-stilbene-2,2′-disulphonic acid or its salts,

(f) 4,4′-di(2″-anilino-4″-diethylaminotriazin-6″-ylamino)-stilbene-2,2′-disulphonic acid or its salts,

(g) 4,4′-di(2″-anilino-4″-monoethanolaminotriazin-6″-ylamino)-stilbene-2,2′-disulphonic acid or its salts,

(h) 4,4′-di(2″-anilino-4″-(1-methyl-2-hydroxy) ethylamino-triazin-6″-ylamino)-stilbene-2,2′-disulphonic acid or its salts,

(i) 4,4″-di(2″-methylamino-4″-p-chloroanilinotrazin-6″-ylamino)-stilbene-2,2′-disulphonic acid or its salts, or

(j) 4,4′-di(2″-diethanolamine-4″-sulphanilinotrazin-6″-ylamino)-stilbene-2,2′-disulphonic acid or its salts,

which consists essentially of the steps of contacting said fluorescent agent at atmospheric pressure and at a temperature not exceeding 75° C., with an aqueous solution containing 0.5–5% by weight of an alkali metal hydroxide in an amount of 25–150 milliliters per gram of fluorescent agent, wherein said fluorescent agent remains substantially undissolved, and separating the fluorescent agent from said aqueous solution.

4,112,227

PYRAZOL-5-ONES

Eike Möller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 461,285, Apr. 15, 1974, Pat. No. 3,952,008. This application Jan. 24, 1975, Ser. No. 543,664

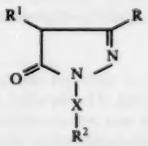
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1973, 2319279; Dec. 19, 1973, 2363138

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 P **48 Claims**

1. A pharmaceutical composition useful for effecting diuresis or saluresis in humans and animals and for treating hypertension in humans and animals which comprises a diuretically effective amount, a saluretically effective amount or an antihypertensive amount of a compound of the formula



(I)

or a pharmaceutically acceptable, nontoxic salt thereof, wherein

R is amino;

R^1 is hydrogen, lower alkyl or lower alkenyl;

X is propenyl or propenyl wherein 1 hydrogen atom on one, two or three of the carbon atoms is substituted by alkyl of 1 to 4 carbon atoms, said propenyl being linked to the N^1 atom of the pyrazole ring via its methylene moiety; and

R^2 is aryl of 6 to 10 carbon atoms unsubstituted or substituted by:

(a) 1 or 2 of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms and lower alkoxy;

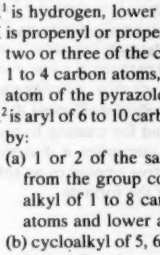
(b) cycloalkyl of 5, 6 or 7 carbon atoms or cycloalkenyl of 5, 6 or 7 carbon atoms;

(c) nitro; or

(d) nitro and 1 or 2 of the same or different substituents selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, halogen and trifluoromethyl;

in combination with a pharmaceutically-acceptable, nontoxic, inert diluent or carrier.

25. A method of effecting diuresis and saluresis in humans and animals and treating hypertension in humans and animals which comprises administering to a human or animal in need thereof a diuretically effective amount, a saluretically effective amount or an antihypertensive amount of a compound of the formula



(I)

or a pharmaceutically acceptable, nontoxic salt thereof, wherein

R is amino;

R^1 is hydrogen, lower alkyl or lower alkenyl;

X is propenyl or propenyl wherein 1 hydrogen atom on one, two or three of the carbon atoms is substituted by alkyl of 1 to 4 carbon atoms, said propenyl being linked to the N^1 atom of the pyrazole ring via its methylene moiety; and

R^2 is aryl of 6 to 10 carbon atoms unsubstituted or substituted by:

(a) 1 or 2 of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms and lower alkoxy;

(b) cycloalkyl of 5, 6 or 7 carbon atoms or cycloalkenyl of 5, 6 or 7 carbon atoms;

(c) nitro; or

(d) nitro and 1 or 2 of the same or different substituents selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, halogen and trifluoromethyl;

in combination with a pharmaceutically-acceptable, nontoxic, inert diluent or carrier.

4,112,228

7-(D-α-HYDROXY-2-ARYLACETAMIDO)-3-(2-CARBOXY-ALKYL-2,3-DIHYDRO-S-TRIAZOLO-[4,3-b]PYRIDAZIN-3-ON-6-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS AND DERIVATIVES

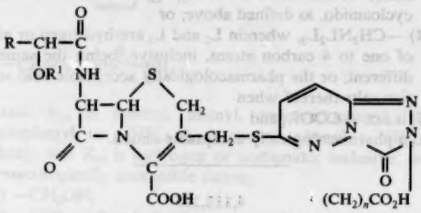
Takayuki Naito, Kawasaki; Jun Okumura, Yokohama, and Hajime Kamachi, Ichikawa, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 705,226, Jul. 13, 1976, abandoned. This application Mar. 16, 1977, Ser. No. 777,986

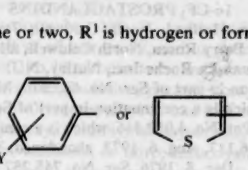
Int. Cl.[2] **C07D** *501/54, 501/56, 519/00*

U.S. Cl. 544—26 **45 Claims**

1. An acid having the D configuration in the 7-sidechain and the formula



wherein *n* is one or two, R^1 is hydrogen or formyl and R is



and Y is hydrogen, chlorine, bromine, fluorine, trifluoromethyl, amino, nitro, hydroxy, lower alkyl of 1–4 carbon atoms or lower alkoxy of 1–4 carbon atoms or a nontoxic, pharmaceutically acceptable salt thereof.

4,112,229

DIPHENYLAMINES FOR DYEING KERATINOUS FIBERS

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

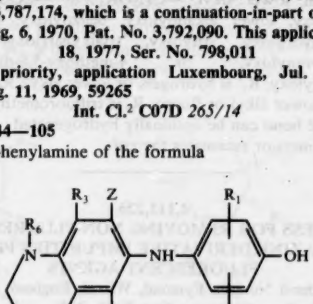
Division of Ser. No. 618,244, Sep. 30, 1975, Pat. No. 4,024,627, which is a continuation of Ser. No. 396,296, Sep. 11, 1973, abandoned, which is a division of Ser. No. 270,650, Jul. 11, 1972, Pat. No. 3,787,174, which is a continuation-in-part of Ser. No. 61,833, Aug. 6, 1970, Pat. No. 3,792,090. This application May 18, 1977, Ser. No. 798,011

Claims priority, application Luxembourg, Jul. 14, 1971, 63527; Aug. 11, 1969, 59265

Int. Cl.[2] **C07D** *265/14*

U.S. Cl. 544—105 **6 Claims**

1. A diphenylamine of the formula



wherein

R_1 is selected from the group consisting of methyl and chlorine,

R_2 is selected from the group consisting of hydrogen and methyl,

R_3 is selected from the group consisting of hydrogen and methyl,
R_5 is hydrogen,
R_6 is selected from the group consisting of hydrogen and methyl and
Z is selected from the group consisting of amino and hydroxy.

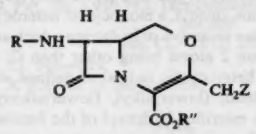
4,112,230

$\Delta^{2,3}$-1,4 MORPHOLINE-2-CARBOXYLIC ACID DERIVATIVES AS ANTIBACTERIAL AGENTS

Marcel Menard; Gary M. F. Lim, both of Candiac, and Terry T. Conway, Brossard, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 567,323, Apr. 11, 1975, Pat. No. 4,011,216. This application Jan. 17, 1977, Ser. No. 759,710
Int. Cl.[2] C07D *265/36, 498/02;* **A01N** *9/00, 9/22*
U.S. Cl. 544—105 **82 Claims**

1. A compound having the formula



II

wherein R is an acyl group of the formula

$$R^aC_nH_{2n}CO- \quad \text{(i)}$$

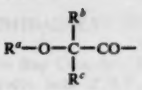
wherein R^a is (a) aryl selected from the group consisting of phenyl, 2-thienyl, 3-thienyl, furyl, 4-isoxazolyl, pyrrolyl, tetrazolyl, sydnone-3 or -4, imidazolyl, naphthoyl, quinoxalinyl, triazolyl, isothiazolyl, thiadiazolyl, thiazolyl, oxazolyl, oxadiazolyl, pyrazolyl, furazan, pyrazinyl, pyrimidinyl, pyridazinyl and triazinyl; (b) substituted aryl in which the aryl groups defined above under (a) are substituted by one or more chloro, bromo, iodo, fluoro, nitro, amino, cyano, (lower)alkanoyloxy, (lower)alkanoyl, (lower)alkoxyamino, (lower)alkoxy, (lower)alkyl, (lower)alkylamino, hydroxy, guanidino, (lower)alkylthio, carboxy, phenyl, halophenyl, trifluoromethyl, di(lower)alkylamino, sulfamyl, (lower)- alkanoylamino, phenyl(lower)alkylamido, cycloalkylamino, allylamido, morpholinocarbonyl, pyrrolidinocarbonyl, piperidinocarbonyl, tetrahydropyridino, furfuylamido or N-alkyl-N-anilino radicals; (c) C_3–C_{12} cycloalkyl; (d) substituted C_{3-C12} cycloalkyl in which the substitutents are one or more chloro, bromo, fluoro, iodo, nitro, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkylamino, C_1–C_2 alkoxy or amino radicals; (e) C_3–C_{12} cycloalkenyl, said cycloalkenyl group having 1 or 2 double bonds; or (f) substituted C_3–C_{12} cycloalkenyl, said cycloalkenyl group having 1 or 2 double bonds and being substituted by one or more chloro, bromo, fluoro, iodo, nitro, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkylamino, C_1–C_2 alkoxy or amino radicals; and *n* is an integer from 1–4;

$$C_nH_{2n+1}CO- \quad \text{(ii)}$$

wherein *n* is an integer from 1–7, the alkyl portion of said acyl group being straight or branched and optionally interrupted by an oxygen or sulfur atom;

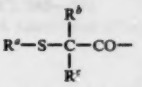
$$C_nH_{2n-1}CO- \quad \text{(iii)}$$

wherein *n* is an integer from 2–7, the alkenyl portion of said acyl group being straight or branched and optionally interrupted by an oxygen or sulfur atom;



(iv)

wherein R^a is as defined above under (i) and in addition may be benzyl, C_{1-C6} alkyl or (lower)alkoxy carbonyl and R^b and R^c which may be the same or different each represent hydrogen, phenyl, benzyl, phenethyl or C_1–C_6 alkyl;



(v)

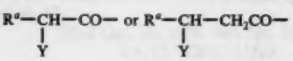
wherein R^a is as defined above under (i) and in addition may be benzyl or C_1–C_6 alkyl and R^b and R^c are as defined under (iv);

$$R^aX(CH_2)_mCO- \quad \text{(vi)}$$

wherein R^a is as defined under (i) and in addition may be benzyl; X is oxygen or sulfur; and m is an integer of 2–5;

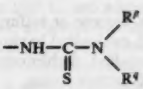
$$R^aCO- \quad \text{(vii)}$$

wherein R^a is as defined under Ii);

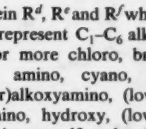


(viii)

wherein R^a is as defined under (i) and Y is hydrazino, guanidino, ureido; substituted ureido of the formula

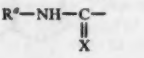


in which R^p is hydrogen or C_1–C_8 alkyl and R^q is hydrogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, phenyl, benzoyl, C_1–C_8 alkoxy-C_1–C_8 alkyl or (carbo-C_1–C_8 alkoxy)C_1–C_8 alkyl; allophanamido; 3-guanyl-1-ureido; 3-(2-furoyl)ureido; 3-(benzoyl-)ureido; cyano; cyanamino; azido; amino; a group obtained by reacting the amino group Y with acetone, formaldehyde, acetaldehyde, butyraldehyde, acetylacetone, methyl acetoacetate, benzaldehyde, salicylaldehyde, methyl ethyl ketone or ethyl acetoacetate; hydroxy; (lower) alkoxy; carboxy; 5-indanyloxycarbonyl; triazolyl; tetrazolyl; halogeno; formyloxy; (lower-)alkanoyloxy; sulfo; or sulfoamino;



(ix)

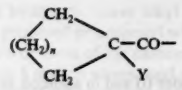
wherein R^d, R^e and R^f which may be the same or different may each represent C_1–C_6 alkyl, phenyl or phenyl substituted by one or more chloro, bromo, iodo, fluoro, trifluoromethyl, nitro, amino, cyano, (lower)alkanoyloxy,(lower)alkanoyl, (lower)alkoxyamino, (lower)alkoxy, (lower)alkyl, (lower)alkylamino, hydroxy, (lower)alkylthio, carboxy, di(lower)alkylamino or sulfamyl radicals;



(x)

wherein R^a is as defined under (i) and in addition may be hydrogen, C_114 C_6 alkyl, halogen-substituted C_1–C_6 alkyl, phen-

ethyl, phenoxymethyl, benzyl or R^a—CO— and X is oxygen or sulfur;



(xi)

wherein Y is as defined under (viii) and n is an integer of 1–4;

$$R^gCH(NH_2)(CH_2)_nCO— \quad \text{(xii)}$$

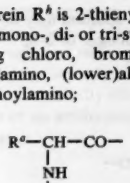
wherein n is an integer of 1–10, or

$$H_2N—C_nH_{2n}Ar(CH_2)_mCO—$$

wherein m is O or an integer from 1–10, and n is 0, 1 or 2; R^g is hydrogen, (lower)alkyl, phenyl, benzyl or carboxy and Ar is p-phenylene or 1,4-naphthylene;

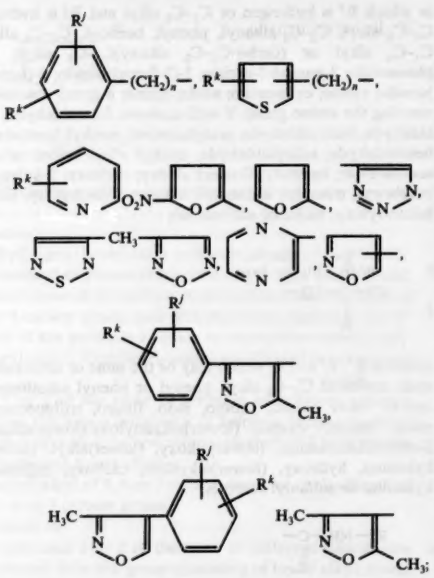
$$R^kCO{\cdot}CO— \quad \text{(xiii)}$$

wherein R^k is 2-thienyl; 3-thienyl; α-naphthyl; 2-phenanthryl or a mono-, di- or tri-substituted phenyl group, the substituents being chloro, bromo, iodo, fluoro, amino, di(lower)-alkylamino, (lower)alkyl, (lower)alkoxy, nitro or (lower)-alkanoylamino;

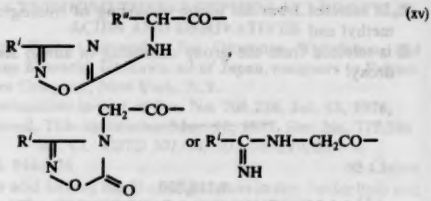


(xiv)

wherein R^a is as defined under (i); X is oxygen or sulfur; X′ is oxygen or imino; and R^l is (lower)alkyl, cycloalkyl having 4, 5, 6 or 7 carbon atoms, monohalo (lower)alkyl, dichloromethyl, trichloromethyl, (lower)alkenyl of 2–6 carbon atoms,

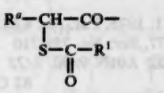


n is an integer from 0 to 3 inclusive and each of R^k and R^l is hydrogen, nitro, di(lower)alkylamino, (lower)alkanoylamino, (lower)alkanoyloxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, sulfamyl, chloro, iodo, bromo, fluoro, or trifluoromethyl;



(xv)

wherein R^a is as defined under (i) and R^l is as defined under (xiv); or



(xvi)

wherein R^a is as defined under (i) and R^1 is (lower)alkyl, cycloalkyl of 3–12 carbon atoms, phenyl, a monocyclic heterocyclic radical having 5 or 6 atoms exclusive of hydrogen which are C, S, N or O, no more than 2 atoms being other than C, or a substituted monocyclic heterocyclic radical as defined above having one or more halo, (lower)alkyl, (lower)alkoxy or phenyl substituents, Z is esterified hydroxyl of the formula

$$—OCOR_2$$

wherein R_2 is hydrogen, amino or (lower)alkyl and R″ is hydrogen or an easily cleavable ester selected from the group consisting of benzhydryl, benzyl, p-nitrobenzyl, p-methoxybenzyl, trichloroethyl, trimethylsilyl, phenacyl, acetonyl, (lower)-alkyl, triphenylmethyl, methoxymethyl, indanyl, phthalidyl, pivaloyloxymethyl and acetoxymethyl, or a pharmaceutically acceptable salt thereof.

4,112,231

PROCESS FOR THE CONDENSATION OF EPOXIDES WITH ORGANIC COMPOUNDS HAVING AN ACTIVE HYDROGEN

Bengt John Gustaf Weibull, Stenungsund, and Leif Urban Folke Thorsell, Domsjoverken, both of Sweden, assignors to Berol Kemi AB, Stenungsund, Sweden

Filed Sep. 1, 1976, Ser. No. 719,646
Claims priority, application Sweden, Sep. 5, 1975, 7509916
Int. Cl.² C07C *41/02*
U.S. Cl. 544—174 **13 Claims**

1. In the process for the addition reaction of organic compounds having an active hydrogen selected from the group consisting of monohydric alcohols, polyols and amines with an epoxide, the improvement which comprises carrying out the reaction at a temperature within the range from about 80 to about 200° C at which the reaction proceeds in the presence of a concentration within the range from about 0.001% to about 10% by weight of the organic compound of an inorganic salt catalyst developing no appreciable acidity or alkalinity in the course of the reaction, accelerating the reaction, and favoring a narrow molecular distribution of adduct species in the reaction product, selected from the group consisting of sodium fluoborate and magnesium, calcium, manganese, nickel and zinc perchlorates.

4,112,232

PROCESS FOR PREPARING CYANURIC ACID

Mario G. R. T. de Cooker, Sittard, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Sep. 19, 1977, Ser. No. 834,664

Claims priority, application Netherlands, Sep. 23, 1976, 7610556

Int. Cl.[2] C07D *251/32*

U.S. Cl. 544—192 12 Claims

1. A process for preparing cyanuric acid, comprising: heating a solution of urea, biuret or a mixture of urea and biuret in a molten salt solvent comprising at least one alkali metal salt or alkaline earth metal salt, and forming cyanuric acid and ammonia in said solution.

4,112,233

HYDANTOIN-CONTAINING POLYENE COMPOSITIONS

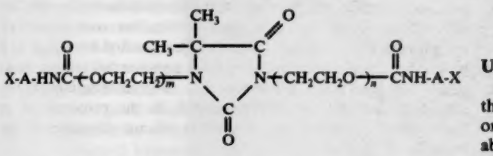
Charles R. Morgan, Brookeville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 614,577, Sep. 18, 1975, abandoned, which is a division of Ser. No. 461,207, Apr. 15, 1974, Pat. No. 3,945,982. This application Nov. 1, 1976, Ser. No. 737,309

Int. Cl.[2] C07D *233/72*

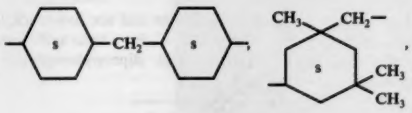
U.S. Cl. 548—312 6 Claims

1. A polyene of the formula:



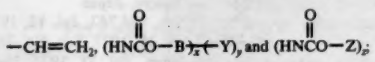
wherein

A is a member of the group consisting of alkylene having from 1 to 10 carbon atoms, cycloalkylene having from 5 to 15 carbon atoms,



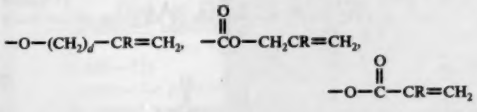
arylene having from 6 to 12 carbon atoms, alkarylene having from 7 to 13 carbon atoms and aralkylene having from 7 to 13 carbon atoms;

X is a member of the group consisting of



B is alkylene having from 1 to 36 carbon atoms;

Y is a member of the group consisting of



and mixtures thereof with the proviso that no more than one Y can be on one carbon atom of B;

Z is $-(CH_2)_d-CR=CH_2$;

R is hydrogen or methyl; x is 1 to 3; y and d are 1 to 10; z is 1 to 2; m and n are each integers of at least 1 with $m + n$ in the range 2 to 22.

4,112,234

IMIDAZOLYLMETHYLTHIOETHYL ALKYNYL GUANIDINES

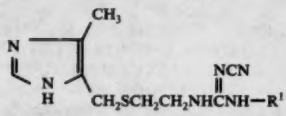
Ronnie Ray Crenshaw, Dewitt, and George Michael Luke, La-Fayette, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 826,796, Aug. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 803,009, Jun. 3, 1977, abandoned. This application Nov. 7, 1977, Ser. No. 848,959

Int. Cl.[2] C07D *233/64*

U.S. Cl. 548—342 12 Claims

1. A compound of the formula



wherein R^1 is a straight or branched chain alkynyl group containing from 3 to 9 carbon atoms, inclusive, or a nontoxic pharmaceutically acceptable acid addition salt thereof.

4,112,235

TRANSESTERIFICATION OF CARBOXYLIC ACIDS

Louis Schmerling, Riverside, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 28, 1976, Ser. No. 736,648

Int. Cl.[2] C07C *67/10*

U.S. Cl. 560—1 9 Claims

1. A transesterification process which comprises reacting, in the presence of a catalytic amount of stannic chloride, bromide or iodide at a temperature in the range of from about 0° to about 150° C. and a pressure in the range of from about atmospheric to about 100 atmospheres, a carboxylic acid selected from the group consisting of fatty acids of from 1 to about 20 carbon atoms, cycloalkanecarboxylic acids having from 5 to 8 carbon atoms in the ring and aromatic carboxylic acids with an alkyl, cycloalkyl, unsaturated aliphatic, cycloaliphatic or benzyl formate, acetate, butyrate, acrylate, crotonate, oleate or benzoate, and recovering the resultant esterified carboxylic acid.

4,112,236

INTERPHENYLENE 8-AZA-9-DIOXOTHIA-11,12-SECOPROSTAGLANDINS

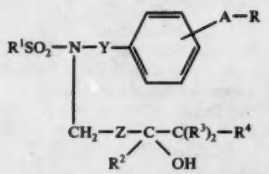
John B. Bicking, and Edward J. Cragoe, Jr., both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 4, 1977, Ser. No. 783,998

Int. Cl.[2] C07C *143/75*; A61K *31/21, 31/19*

U.S. Cl. 560—12 28 Claims

1. The compound having the following formula:



wherein

R is carboxy, a pharmaceutically acceptable carboxy salt, or alkoxycarbonyl of the formula —$COOR^5$ wherein

R^5 is alkyl of 1–10 carbon atoms;

A is $(CH_2)_n$ wherein n is 0 or 2, or oxymethylene or vinylene;

Y is $(CH_2)_n$ wherein n is 1, 3, or 4, provided that the sum of chain-forming elements in A and Y is either 3 or 4;

R^1 is lower alkyl of 1–4 carbon atoms;

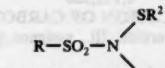
Z is ethylene, vinylene, or ethynylene;
R^2 is hydrogen or methyl;
R^3 is hydrogen or methyl; and
R^4 is lower alkyl of 3–6 carbon atoms straight or branched or 3-butenyl, provided that in one instance wherein R^4 is lower alkyl and R^2 is methyl, R^4 and R^2 are joined together with abstraction of hydrogen to form a carbocyclic ring of form 6–9 members, and further provided that in one instance when R^4 is lower alkyl and R^2 is hydrogen, R^4 and the carbon bearing R^2 and OH are joined with abstraction of hydrogen to form a carbocyclic ring of from 5–8 members.

4,112,237
FUNGICIDAL, MITICIDAL AND OVICIDAL ALKOXYCARBONYLALKYL-SUBSTITUTED AND CARBAMYLALKYL-SUBSTITUTED N-HALOALKYLTHIOSULFONAMIDES

David Cheong King Chan, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 22, 1976, Ser. No. 734,858
Int. Cl.² C07C *145/02*; A01N *9/16*
U.S. Cl. 560—12 6 Claims

1. A compound of the formula



wherein R is phenyl substituted with up to 2 of the same or different substituents selected from fluoro, chloro, bromo, iodo, trifluoromethyl, trichloromethyl, tribromomethyl, tribromomethyl or alkyl of 1 to 4 carbon atoms; R^1 is alkoxycarbonylalkyl of 2 to 6 carbon atoms; and R^2 is alkyl of 1 to 2 carbon atoms and of 1 to 5 fluoro, chloro, bromo or iodo atoms.

4,112,238
METHOD FOR THE PREPARATION OF PURE 2-ETHYLHEXYL GALLATE

Douglas W. Chapman, and Hugh C. Bertsch, both of St. Louis, Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Feb. 17, 1977, Ser. No. 769,828
Int. Cl.² C07C *67/48, 69/88*
U.S. Cl. 560—70 12 Claims

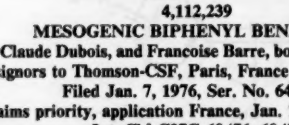
1. A method for preparing pure 2-ethylhexyl gallate which comprises treating crude 2-ethylhexyl gallate with a solvent system consisting essentially of a major proportion of a liquid aliphatic hydrocarbon solvent and a minor proportion of 2-ethylhexanol, the latter being present in a proportion of more than one percent and not more than about eight percent by volume, and separating pure 2-ethylhexyl gallate therefrom.

4,112,239
MESOGENIC BIPHENYL BENZOATES

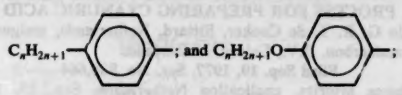
Jean Claude Dubois, and Francoise Barre, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 7, 1976, Ser. No. 647,745
Claims priority, application France, Jan. 10, 1975, 75 00719
Int. Cl.² C07C *69/76, 69/92*
U.S. Cl. 560—73 3 Claims

1. A mesogenic compound of the formula:


(1)

wherein R is selected from the group consisting of



and n is a whole number from 1 to 20.

4,112,240
PROCESS FOR THE MANUFACTURE OF LIGHT COLORED DIPROPYLENEGLYCOL DIBENZOATE

Hans Leo Hulsmann, Wetter, Ruhr, and Gustav Renckhoff, Witten, Ruhr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Bezirk Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 505,113, Sep. 11, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,580
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1973, 2346560
Int. Cl.² C07C *69/78*
U.S. Cl. 560—112 6 Claims

1. Process for the manufacture of dipropyleneglycol dibenzoate isomer mixture, which comprises contacting technical methyl benzoate containing more than 80 wt.% methyl benzoate which is the product of production of dimethyl terephthalate by catalytic oxidation of p-xylene and/or methyl-p-toluate and esterification of the resulting acids with methanol, to produce a crude reaction product rich in dimethylterephthalate, treatment of the crude product to recover dimethylterephthalate and produce said technical methyl benzoate as a by-product, with dipropylene glycol commercial isomer mixture of 1,1'-oxy-di-2-propanol, 2-(hydroxypropoxy)-1-propanol, and 2,2''-oxy-di-1-propanol, in the presence of at least one of aluminum and aluminum silicon alkoxides of the formula

$$Al(OR)_3$$

or

$$(RO)_3SiOAl(OR)_2$$

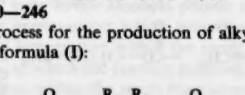
wherein the R's are alike or different and are lower alkyl, as catalyst, at temperature above 150° C, for a time sufficient for transesterification to produce said dipropyleneglycol dipropyleneglycol dibenzoate.

4,112,241
PROCESS FOR PRODUCING ALKYLENE GLYCOL ESTERS

Takeshi Okano, Machida; Naoto Wada, Komae, and Yoshimitsu Kobayashi, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

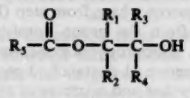
Continuation-in-part of Ser. No. 704,743, Jul. 12, 1976, abandoned. This application Mar. 30, 1977, Ser. No. 783,226
Claims priority, application Japan, Jul. 31, 1975, 50-93468; Jul. 31, 1975, 50-93469; Sep. 2, 1975, 50-106137; Dec. 25, 1975, 50-155192
Int. Cl.² C07C *67/05*
U.S. Cl. 560—246 11 Claims

1. In a process for the production of alkylene glycol esters having the formula (I):


(I)

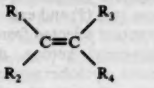
wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen, C_1-C_{20} alkyl and C_6-C_{20} aryl; and R_5 is C_1-C_{20} alkyl or C_6-C_{20} aryl,

and/or the formula (II):



(II)

wherein R_1, R_2, R_3, R_4 and R_5 are as defined herein above, which comprises reacting an olefin having the formula (III):



(III)

wherein R_1, R_2, R_3 and R_4 are as defined herein above, a carboxylic acid having the formula (IV):

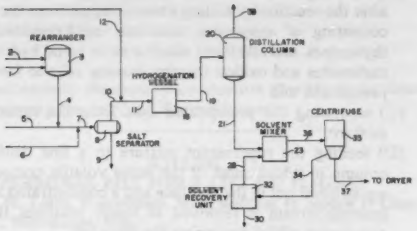
$$R_5 - CO_2H \qquad \text{(IV)}$$

wherein R_5 is as defined herein above,
and molecular oxygen in the liquid phase, the improvement which comprises conducting said reaction in the presence of a catalyst of at least one nitrogen oxide selected from the group consisting of nitric acid, alkali metal salts of nitric acid, alkaline earth metal salts of nitric acid, aluminum nitrate, NO, NO_2, N_2O_3, N_2O_5 nitrous acid, alkali metal salts of nitrous acid, alkaline earth metal salts of nitrous acid, aluminum nitrite, alkyl esters of nitrous acid and alkyl esters of nitric acid in combination with at least one iodine-containing substance selected from the group consisting of iodine, hydroiodic acid, organic alkyl iodides, alkali metal salts of hydroiodic acid, alkaline earth metal salts of hydroiodic acids, aluminum iodide, hypoiodous acid, alkali metal salts of hypoiodous acid, alkaline earth metal salts of hypoiodous acid, aluminum hypoiodite, alkyl carbonyl hypoiodites, iodic acid, alkali metal salts of iodic acid, alkaline earth metal salts of iodic acid, aluminum iodate, peroxyiodic acid, alkali metal satls of peroxyiodic acid, alkaline earth metal salts of peroxyiodic acid, aluminum peroxyiodate, I_2O, I_2O_5, polyiodic acid, alkali metal salts of polyiodic acid, alkaline earth metal salts of polyiodic acid and aluminum polyiodate.

4,112,242
PROCESS FOR PRODUCTION OF 4,4-ISOPROPYLIDENE-BIS-2,6-DIBROMO/PHENOL
Janusz Swietoslawski; Andrzej Silowiecki, both of Jaworzno; Aleksander Ratajczak, Katowice; Barbara Nocoń, Wolbrom, and Zofia Baniak, Jaworzno, all of Poland, assignors to Zaklady Chemiczne "Organika-Azot", Jaworzno, Poland
Filed Apr. 25, 1977, Ser. No. 790,568
Claims priority, application Poland, May 4, 1976, 189331
Int. Cl.[2] C07C *37/00*
U.S. Cl. 568—726 **2 Claims**

1. A process for production of 4,4'-isopropylidene-bis-/2,6-dibromo/phenol wherein each one mole of 4,4'-isopropylidenebisphenol reacts with 2,0–2,1 moles of liquid bromine in an organic solvent or organic solvent-water solution at 30°–45° C., significant in that the degree of bromine-utilisation is increased through subsequent treatment with about 0.67 mole of an alkali metal chlorate.

4,112,243
PRODUCTION OF HYDROQUINONE FROM NONAQUEOUS SOLVENT SYSTEMS
Edward Norbert Nowak, Uniontown; Lawson Gibson Wideman, Akron, and David Alan Hutchings, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sep. 14, 1977, Ser. No. 833,203
Int. Cl.[2] C07C *39/08*
U.S. Cl. 568—768 **9 Claims**



1. In a process for making hydroquinone comprising the steps of
(a) reacting a feed stream comprising p-diisopropylbenzene dihydroperoxide
(1) in a reaction solvent selected from the group consisting of benzene, monoalkyl benzenes wherein the alkyl group has from 1-4 carbon atoms (1-4C), dialkyl benzenes wherein the alkyl groups have 1-4C, trialkyl benzenes wherein the alkyl groups have 1-4C, mixtures of the aforesaid aromatics with acetone and acetone
(2) with an acid selected from the group consisting of H_3PO_4, $HClO_4$, p-toluene-sulfonic acid, SO_2, HBF_4, H_2SiF_6, BF_3 and any other Lewis acid
(3) in the temperature range of about 50° to 100° C. to form hydroquinone and acetone;
(b) adjusting the pH of the mixture after the reaction to from 2.5 to 5.5 by adding a base, thereby causing acid salts to form and precipitate;
(c) separating the precipitated salts from the supernatant mixture; wherein the improvement comprises the steps of:
(d) hydrogenating the supernatant from step (c) with a Raney nickel catalyst to remove color;
(e) concentrating the mixture of step (d);
(f) adding to the concentrated mixture a solvent selected from the group consisting of methylene chloride, carbon tetrachloride, 1,1,2-trichloroethane, trichloroethylene, fluorocarbons containing 2–6 carbon atoms, fluorochlorocarbons containing 1–4 carbon atoms, pentane, hexane, heptane, and cyclohexane, thereby causing hydroquinone crystals to precipitate; and
(g) separating the hydroquinone from the supernatant liquid in step (f).

4,112,244
RECOVERY OF HYDROQUINONE
Edward Norbert Nowak, Uniontown, and William Shepherd Hollingshead, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 16, 1978, Ser. No. 870,051
Int. Cl.[2] C07C *37/08*
U.S. Cl. 568—768 **9 Claims**

1. In a process for making and recovering hydroquinone comprising the steps of:
(A) reacting a feed stream comprising p-diisopropylbenzenedihydroperoxide
(1) in a reaction solvent selected from the group consisting of methyl isopropyl ketone, diisopropyl ketone, methyl isobutyl ketone, cyclohexanone, 1-pentanol, 3-pentanol, diethyl ether, diisopropyl ether, ethylisopropyl ether and mixtures of the foregoing with acetone;

(2) with an acid catalyst selected from the group consisting of H_3PO_4, $HClO_4$, p-toluene-sulfonic acid, SO_2, HBF_4, H_2SiF_6, BF_3 and any other Lewis acid in a concentration of from 0.05 to 3.0 weight percent of the reaction mixture;

(3) with less than 3 weight percent water present in the reaction mixture;

(4) within a temperature range of from 50° to 100° C. to form hydroquinone and acetone;

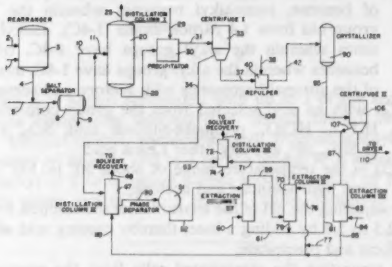
(B) adjusting the pH of the mixture to from about 2.5 to 5.5 after the reaction by adding a base selected from the group consisting of anhydrous ammonia, methylamines, triethylamines, and alkali and alkaline earth metal hydroxides, carbonates and oxides, thereby causing salts to form and precipitate; and

(C) separating the precipitated salts from the supernatant mixture;

(D) feeding the supernatant mixture to a first distillation column in which most of the more volatile components are stripped out in the distillate and a concentrated hydroquinone stream is removed as tower bottoms; the improvement which comprises the steps of:

(E) precipitating hydroquinone crystals by adding a precipitating solvent to the bottoms stream from step (D);

(F) separating the hydroquinone crystals in the slurry obtained in step (E) from the supernatant organic liquid;



(G) feeding the supernatant liquid from step (F) to a second distillation column in which are combined the unit operations of distillation, to remove the acetone and most of the reaction solvent in the distillate, and extraction of the hydroquinone into a water phase which exits the second distillation column together with an organic phase as the distillation bottoms stream;

(H) subjecting the bottoms from step (G) to a phase separation wherein the aqueous phase contains most of the hydroquinone and the organic phase contains substantially all the impurities and a small quantity of hydroquinone;

(I) extracting the aqueous phase from step (H) with an extractant selected from the group consisting of methyl isopropyl ketone, diisopropyl ketone, methyl isobutyl ketone, cyclohexanone, 1-pentanol, 3-pentanol, diethyl ether, diisopropyl ether and mixtures of the foregoing in order to remove tars;

(J) extracting the organic extract from step (I) with water in order to recover residual hydroquinone from said extract;

(K) combining the aqueous raffinate from step (I) with the aqueous extract from step (J) and extracting the combined stream with an extractant selected from the group consisting of methyl isopropyl ketone, diisopropyl ketone, methyl isobutyl ketone, cyclohexanone, 1-pentanol, 3-pentanol, diethyl ether, diisopropyl ether, ethylisopropyl ether and mixtures of the foregoing; and

(L) recycling the organic extract from step (K) to the distillation step (D).

4,112,245

PROCESS FOR THE PREPARATION OF ETHYLENE GLYCOL

Lee R. Zehner, Media, Pa., and R. Warren Lenton, Sewell, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 18, 1976, Ser. No. 715,747

Int. Cl.² C07C *29/00, 31/20*

U.S. Cl. 568—864 **13 Claims**

1. A process for the preparation of ethylene glycol which comprises reacting under vapor phase conditions a gaseous mixture of an oxalate ester having the formula

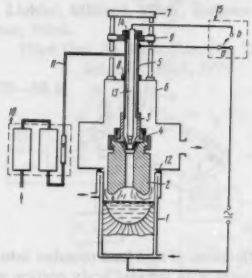
wherein R is an alkyl or aralkyl group which may contain substituents which would not interfere with the reaction, said oxalate ester having a sulfur content of less then 0.4 ppm, with an essentially sulfur-free hydrogen at a pressure of between about 15 psia and 1000 psia, the molar ratio of hydrogen to oxalate ester in the reaction being from 4:1 to 30:1, at a temperature in the range of about 150° C. and 300° C., and at a space velocity between about 3000 hr^{-1} and 20,000 hr^{-1} and a liquid hourly space velocity of between about 0.001 hr^{-1} and 5.0 hr^{-1} in the presence of an effective amount of a copper-containing hydrogenation catalyst which catalyst has been subjected to a prereduction in hydrogen at a temperature of from about 100° C. to 450° C. and at a hydrogen pressures of from about 0.01 to 10 atmospheres, and recovering the ethylene glycol.

4,112,246

PLASMARC FURNACE FOR REMELTING METALS AND ALLOYS

Viktor Iosifovich Lakomsky, ulitsa Anri Barbjusa, 22-26, kv. 119; Ivan Vasilievich Sheiko, ulitsa Schuseva, 36, kv. 32; Georgy Mikhailovich Grigorenko, ulitsa Frolovskaya, 1, kv. 5; Gennady Fedorovich Torkhov, ulitsa Prazhskaya, 3, kv. 456; Vladimir Kirillovich Trigub, ulitsa Vernadskogo, 63, kv. 61, all of Kiev; Albert Nikitovich Korotkov, prospekt Lenina, 228, kv. 2, Zaporozhie; Viktor Mikhailovich Kurganov, prospekt Lenina, 120, kv. 8, Zaporozhie; Evgeny Isaevich Moshkevich, ulitsa Stalevarov, 30, kv. 47, Zaporozhie; Alexei Ivanovich Pakhomov, ulitsa Pravdy, 25, kv. 9, Zaporozhie, and Emil Vasilievich Verkhovtsev, ulitsa Ordzhonikidze, 28, kv. 9, Izhevsk, all of U.S.S.R.

Filed Oct. 20, 1976, Ser. No. 734,032
Int. Cl.[2] H05H *1/26*
U.S. Cl. 13—2 P 2 Claims



1. A plasma-arc furnace for remelting metals and alloys in a controlled atmosphere, which comprises: a crystallizer; a hollow consumable electrode having an axial cavity accommodated in said crystallizer; an arc plasmatron having an axial cavity and leads with a non-consumable electrode disposed above said hollow consumable electrode in coaxial relationship therewith; a hollow rod having an axial cavity disposed above said arc plasmatron with a nonconsumable electrode in coaxial relationship therewith; a vertical-travel mechanism connected to said hollow rod and driving same; a plasma-forming gas supply and flow rate control system connected with the plasma-discharge zone via a gas conduit defined by the cavities of the hollow rop, the arc plasmatron and the consumable electrode; and a source of electric power supply having opposite poles; said crystallizer and said hollow rod are coupled to the opposite poles of the source of electric power supply, and the leads of said arc plasmatron are insulated from the hollow rod.

4,112,247

GAS FEEDER PIPE ASSEMBLY INCLUDING ELECTRICAL CONDUCTORS

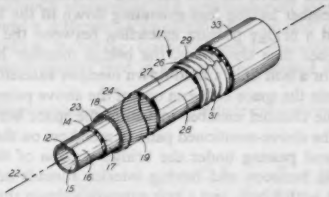
Matthew R. Dembiak, Clifton, N.J.; John F. Finnegan, Claymont; Thomas B. Reece, Wilmington, both of Del., and Howard W. Rudolph, Jr., Birdsboro, Pa., assignors to Western Electric Company, Inc. and American Telephone & Telegraph Co., Inc., both of New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,669
Int. Cl.[2] H01B *7/18*
U.S. Cl. 174—16 R 4 Claims

1. A conduit which comprises:

a central duct formed of a cylindrically rolled sheath bonded with an overlap to itself, and a plastic extrusion duct jacket bonded around the sheath in a pressurable combination for carrying a fluid under pressure, the duct jacket having a smooth outer surface;

a plurality of electrical, insulated conductors located in a peripheral skew about the duct, the conductors being slidably supported against the outer surface of the duct jacket; and



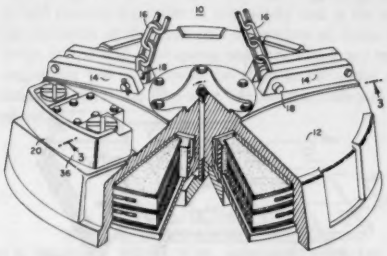
a continuously electrically conductive, flexible metal tube enclosing the duct and the conductors.

4,112,248

TERMINAL BOX FOR A LIFTING MAGNET

Ernest W. Leive, Wauwatosa, Wis., assignor to Square D Company, Milwaukee, Wis.

Filed Oct. 27, 1976, Ser. No. 735,928
Int. Cl.[2] H01F *7/06*
U.S. Cl. 174—50 17 Claims



1. A terminal box for a lifting magnet, comprising: an arcuate front wall slanting inwardly from the outer edge of its bottom surface as it extends upwardly therefrom; a pair of opposing side walls connected to the bottom surface of the front wall and to the ends of the front wall, said side walls extending upwardly from their bottom surfaces to the same height as the front wall and slanting inwardly towards one another as they extend upwardly from their bottom surfaces, said arcuate front wall and said side walls defining a protective shield; a top wall recessed below the upper edge of the protective shield and extending laterally outwardly from the concave side of the protective shield; a rear wall connected between the top wall and bottom surfaces of side walls and connected at each end to the side walls whereby the slant and arcuate shape of the protective shield causes blows directed at the terminal box when mounted on the magnet with its arcuate front wall adjacent the outer edge of the magnet to glance off without mechanical damage to the box.

4,112,249

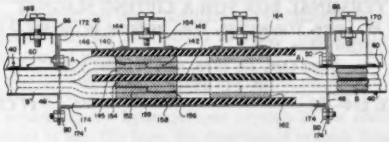
BUS TRAY ELECTRICAL DISTRIBUTION SYSTEM

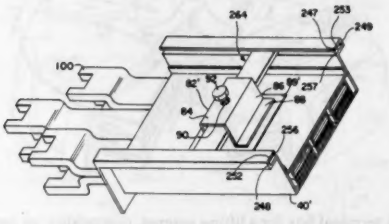
Elmer T. Carlson, Sandpiper Bay Marina, Port St. Lucie, Fla. 33452

Continuation-in-part of Ser. No. 554,684, Mar. 3, 1975, Pat. No. 4,008,365. This application Dec. 29, 1976, Ser. No. 755,446
Int. Cl.[2] H02G *5/06*
U.S. Cl. 174—68 B 12 Claims

1. A bus bar and conduit setup comprising a U-cross-sectioned channel member having on the upper part of the U at least one pair of members on each side which pairs of members extend inwardly from an outermost point one above the other with a space between them, a set of bus bars within the channel member but insulated therefrom, which bus bars extend longi-

tudinally of the channel member, a cover inside the channel member and above the bus bars and insulated from them, a bridge member having legs extending down to the top of the cover and a bridge portion extending between the legs at a place higher than the cover, the bridge member having an opening for a bolt in it, a hold-down member extending across from within the space between one of the above pairs of members on the channel member to within the space between the other of the above-mentioned pairs of members on the channel member and passing under the bridge portion of the bridge member in between and having interior threads adapted to cooperate with a bolt, and a bolt extending down through the opening in the bridge member at least into the interior thread in the hold-down member and thus adapted to exert pressure on the bridge member and cover from the hold-down member and channel member.





4. In a bus tray electrical distribution system, flat insulated rigid and flexible laminated bus bars side by side and compressed into a coextending tray and cover having single and paired opposite phase bus bar ends extended, electrically separated, insulation removed for overlap joining to second bus bars that sandwich one half cross section and area of each bus bar end between the coextension of the remaining one half cross section and twice the area of the remainder half of each bus bar end, hold-down set-ups at intervals along the cover and remote from the tray and cover, extending across the tray and in one position engaging the two sides of the tray, channels bridging each hold-down setup from the cover and having in each case a base, bolts extending in each case through the base of the channel and through the hold-down setups, the hold-down setups including interior threads at least into which the bolts can extend, the hold-down setups in one position extending across the tray and securing the tray and also through each channel pressing the cover with respect to the tray.

4,112,250

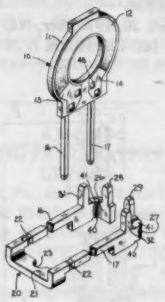
TERMINAL FOR ELECTRICAL COMPONENT AND METHOD OF MAKING SAME

Jerry T. Moffitt, Muskego, and Robert W. Bulgrin, Fort Atkinson, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed May 26, 1977, Ser. No. 800,680
Int. Cl.[2] H01C 1/14
U.S. Cl. 338—322 **5 Claims**

1. A method of attaching a terminal lead member to an apertured, relatively flat, ceramic substrate having oppositely disposed surfaces, at least one of which supports a deposited electrical circuit layer, and wherein the apertures extend through the substrate and intersect each of said surfaces, said method comprising the steps of:

forming an elongated terminal lead member with a body portion, a lead portion extending outwardly of said substrate and lying in a plane substantially parallel with the plane of the circuit supporting layer of said substrate, and an integrally formed portion bent angularly relative to said body portion, a plurality of integrally formed, spaced apart projections each extending laterally relative to said terminal lead member, at least one of said projections being formed in said angularly bent portion and at least one of said projections being formed in said body portion;



inserting the projections of said lead member into respective substrate apertures with the said body portion and the said angularly bent portion each lying adjacent to the surface oppositely disposed from said circuit layer supporting surface of said substrate and with the distal end of each of said projections extending through their respective apertures beyond the circuit layer supporting surface of said substrate; and

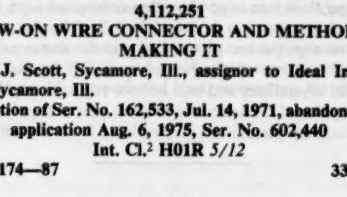
applying an axially directed force to said projections to upset the respective extended distal ends thereof to laterally distend the ends for clamping engagement with said substrate.

4,112,251

SCREW-ON WIRE CONNECTOR AND METHOD OF MAKING IT

William J. Scott, Sycamore, Ill., assignor to Ideal Industrie, Inc., Sycamore, Ill.

Continuation of Ser. No. 162,533, Jul. 14, 1971, abandoned. This application Aug. 6, 1975, Ser. No. 602,440
Int. Cl.[2] H01R 5/12
U.S. Cl. 174—87 **33 Claims**



14. In an electrical connector for joining the stripped ends of two or more electrical wires, a circumferentially distortable relatively nonexpandable retainer for receiving the stripped ends of the wires and being generally tapered between an open larger end and a closed smaller end with an open interior

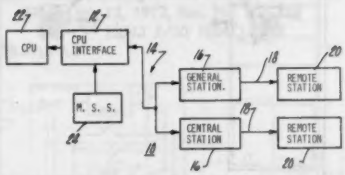
therebetween, a thread-forming surface on the open interior of the retainer, and exterior means on the retainer for transmitting wire connecting torque to the retainer to cause the thread-forming surface on the open interior thereof to be turned down on and thread the stripped ends of the wires.

27. A method of making an electrical connector of the screw-on type, including the steps of winding a relatively stiff wire into a tapered coil, applying brazing material to the coil, heating the coil to a sufficient temperature such that the wire of the coil will be annealed sufficiently so that the turns will distort without expanding as it is screwed onto the ends of two or more wires and, at the same time, the brazing material will fuse the coil into a relatively solid structure, and thereafter enclosing the coil in an insulating plastic shell.

4,112,252
MULTI-TERMINAL SERIALLY COMMUNICATING SHARED LOGIC TEXT EDITING SYSTEM

Jerome E. Liebler, Milford, Mich., assignor to Omnitext, Inc., Ann Arbor, Mich.

Filed Oct. 20, 1976, Ser. No. 734,236
Int. Cl.² H04L 5/14
U.S. Cl. 178—58 R **11 Claims**



1. A system for bi-directional serial communication along a single communications pathway between a central station and remote station, said communication including a data signal and at least two synchronization signals, said system comprising:

means for encoding said synchronization signals at said central station,

means for decoding said synchronization signals at said remote station,

means for inhibiting said data signal during said synchronization signals,

means for transferring a control signal from said central station to said remote station during one of said synchronization signals, and

means for transferring information from said remote station to said central station during the other of said synchronization signals.

4,112,253
DEVICE FOR THE TRANSMISSION OF PUSH-PULL SIGNALS ACROSS A TWO-WIRE LINE IN FULL DUPLEX OPERATION

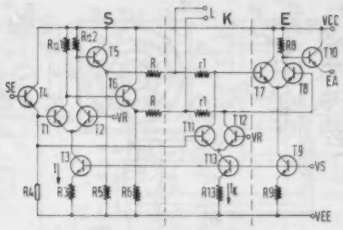
Wilhelm Wilhelm, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 24, 1977, Ser. No. 809,808
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2633066
Int. Cl.² H04L 5/14
U.S. Cl. 178—58 R **5 Claims**

1. In a device for the transmission of push-pull signals over a two wire line in full duplex operation in which a push-pull transmitter is connected to the line and operable for the transmission of push-pull signals to an opposite station, a push-pull receiver is associated with the transmitter and coupled to the line for the simultaneous reception of the push-pull signals transmitted from the opposite station, and a compensation circuit is connected to the line and to the receiver for compensating the push-pull signal transmitted from the associated push-pull transmitter in relation to the inputs of the push-pull receiver, the improvement wherein:

said push-pull transmitter and said push-pull receiver each include a differential amplifier, each of said differential amplifiers including emitter-coupled transistors and a constant current feed to said emitter-coupled transistors; and

said compensation circuit is of symmetrical construction and

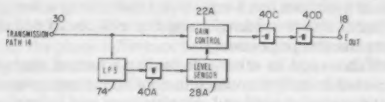


includes a pair of identical decoupling resistors which connect the inputs of said push-pull receiver to respective wires of the two wire line, and means for feeding currents to said decoupling resistors alternately and in the operating sequence of the push-pull transmitter to cause volate drops across said decoupling resistors which are equal in magnitude and in opposite direction to the signal amplitude placed on the two-wire line by the push-pull transmitter.

4,112,254
SIGNAL COMPANDER SYSTEM

David E. Blackmer, Wilton, N.H., assignor to DBX, Inc., Newton, Mass.

Filed Oct. 17, 1977, Ser. No. 842,465
Int. Cl.² H04B 3/04
U.S. Cl. 179—1 VL **21 Claims**



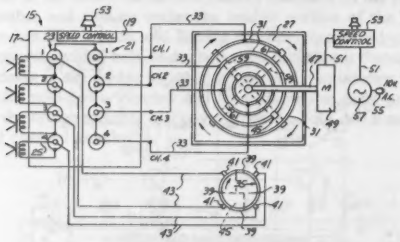
16. In a system for conditioning an input signal having a predetermined frequency bandwidth, said system comprising an input terminal for receiving said input signal, an output terminal, a signal path coupled between said input and output terminals and including amplification means for amplifying said input signal by a gain variable responsively to a control signal, and a level sensing path including means for sensing the amplitude of said input signal and for providing, responsively to said sensing, said control signal as a logarithmic function of the amplitude of said input signal, the improvement comprising:

means, including at least one network disposed in said signal path and at least one other network disposed in said level sensing path, for emphasizing and weighting within a portion of said frequency bandwidth the energy content of said input signal, with respect to the energy content of said input signal in the remaining portions of said frequency bandwidth so that the response of said system at said output terminal to a single-frequency sine wave sweep throughout said frequency bandwidth applied to said input terminal is substantially flat throughout said frequency bandwidth.

4,112,255
ROTA-PHONIC SYSTEM FOR STEREO QUADROPHONIC SOUND SYSTEM

Warren A. Draw, Detroit, Mich., assignor to Elizabeth Draw, Detroit, Mich., a part interest

Filed May 18, 1977, Ser. No. 798,069
Int. Cl.[2] H04R 5/00
U.S. Cl. 179—1 GQ 10 Claims



10. A rota-phonic balancing device adapted for connecting a series of independent sound channel inputs to a corresponding series of different output speakers, with each speaker receiving one output, and for progressively changing each channel input to a different speaker, so that each channel input is transferred to each of said speakers progressively;

comprising a housing;

a panel on the housing having a series of independent electrical sound outputs and a corresponding series of independent sound inputs;

a quad plate mounted within said housing;

a series of concentric circular conductors mounted on said plate in insulated relation, each conductor connected to one of said inputs;

a potentiometer-type of balancing ring parallel to and spaced from said quad plate and having a series of quadrants, each quadrant having a contact connected to one of said outputs respectively;

a conductive quad dial rotatively disposed between said quad plate and balancing ring in the form of a cross, with right-angularly related conductive arms, corresponding to said quadrants, each arm of said dial having a first contact on one side in continuous registry with one of said circular conductors respectively;

each arm upon its other side having a second contact connected to its first contact, in continuous engagement with and spaced around and movable over said balancing ring;

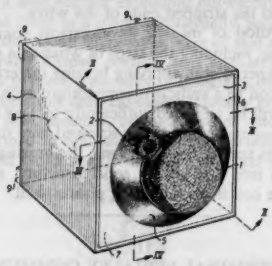
and motor means on said housing connected to said quad dial for continuous rotating said dial at a pre-set uniform speed.

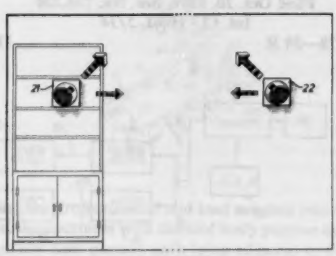
4,112,256
LOUDSPEAKER AND STEREOPHONIC LOUDSPEAKER SYSTEM

Stig Carlsson, Torkel Knutssonsgatan 15, Stockholm, Sweden

Continuation of Ser. No. 498,574, Aug. 19, 1974, abandoned.
This application Nov. 2, 1976, Ser. No. 738,006
Claims priority, application Sweden, Aug. 24, 1973, 7311561
Int. Cl.[2] H04R 5/02
U.S. Cl. 179—1 GA 13 Claims

1. A loudspeaker for use in a stereophonic or quadraphonic sound reproducing system and intended to be placed on a horizontal or vertical support, said loudspeaker comprising a substantially rectangular casing having a frontal wall, a rear wall and a bottom wall which walls define a frontal direction representing a normal to a vertical room-wall in front of which said casing is positioned in close proximity, a single high frequency radiating means, said mid-frequency radiating means, the high frequency radiating means and the mid-frequency radiating means having at least one loudspeaker mechanism mounted on said front wall of the casing, and said at least one loudspeaker mechanism for the high frequency range being mounted in such a manner as to face in a forwardly and sidewardly and upwardly direction which points sidewardly at an



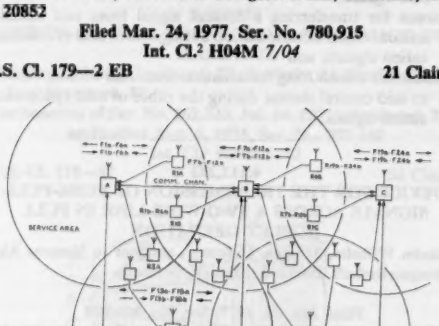


angle of at least $\pi/15$ radians to said frontal direction and upwardly at an angle of at least $\pi/15$ radians relative to said frontal direction.

4,112,257
COMPREHENSIVE AUTOMATIC MOBILE RADIO TELEPHONE SYSTEM

Edward G. Frost, 12000 Old Georgetown Rd., Rockville, Md. 20852

Filed Mar. 24, 1977, Ser. No. 780,915
Int. Cl.[2] H04M 7/04
U.S. Cl. 179—2 EB 21 Claims



1. A multi-channel mobile radio telephone system of the type wherein mobile stations are capable of initiating and receiving calls to and from other mobile stations and stations in a public telephone system, wherein a base station serves as a relay link for all calls and is capable of transmitting and receiving calls via each of said channels, wherein a plurality of mobile stations are each individually tunable to respective channels for pur-

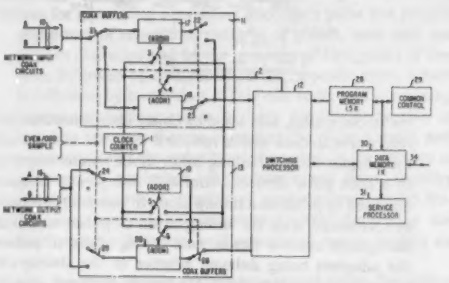
poses of transmitting and receiving signals during calls, wherein each channel comprises a modulation band of audio frequencies modulating a respective carrier frequency, said system being characterized in that each modulation band is divided into at least two frequency sub-bands, a first of said sub-bands being reserved for voice communications, a second of said sub-bands being reserved exclusively for control and supervisory signalling, and further including means at said base station for transmitting said control and supervisory signals in said second sub-band of all said channels simultaneously.

4,112,258

COMMUNICATION SYSTEM USING INTELLIGENT NETWORK PROCESSOR

Harold Gene Alles, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 12, 1977, Ser. No. 841,365
Int. Cl.[2] H04J *3/00*; H04Q *3/54*
U.S. Cl. 179—15 AT **29 Claims**



1. A switch for interconnecting respective digital call signals of different communication call paths between randomly selectable switch ports corresponding to the paths, the switch comprising

means for storing the signals of input ports of said switch in a first predetermined series of storage locations, respectively,

means for variably processing said stored signals in accordance with predetermined subroutines related at least to effecting said randomly selectable interconnecting of signals and optionally selectable additional subroutines related to predetermined characteristics of a communication call of which said signals are a part, to produce processed call signals, and

means for storing said processed signals in a second predetermined series of storage locations corresponding to output ports, respectively, of said switch.

27. A communication system switch for coupling any one of a plurality of received call signal samples from different sources to any one of a plurality of call signal destinations, said switch comprising

first signal storing means having a signal sample storage location for each of said sources,

second signal storing means having a signal sample storage location for each of said destinations, and

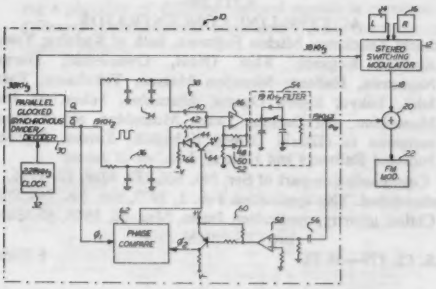
means for selecting signal samples from said first storing means in any order, regardless of destination for each such sample, and coupling such sample into said second storing means at a location determined by said destination for such signal sample.

4,112,259

AUTOMATIC PHASE CONTROLLED PILOT SIGNAL GENERATOR

Geoffrey N. Mendenhall, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Filed Mar. 25, 1977, Ser. No. 781,101
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—15 BT **6 Claims**



1. Apparatus for generating a pilot signal for use in an FM stereo modulating system and comprising:

means for generating a first square wave signal to be used as a switching signal in an FM stereo modulating system and a second square wave signal in phase synchronism therewith but having one-half the frequency thereof;

controllable phase shifter means responsive to said second signal for generating a phase adjusted signal having a phase adjusted in accordance with a control signal supplied to said controllable phase shifter means;

filter means for filtering said phase adjusted signal to remove all harmonics above the fundamental whereby said fundamental is provided at the output of said filter means and serves as said pilot signal;

high speed comparator means responsive to said pilot signal for deriving a square waveform therefrom which is synchronized in phase with said pilot signal; and,

digital phase comparison means responsive to the relative logic states of said second signal and said square waveform derived from said pilot signal for determining therefrom the phase difference between said signals and providing said control signal in response to said phase difference so as to substantially synchronize the phase between said second signal and said pilot signal, whereby said pilot signal is substantially in phase synchronism with said switching signal.

6. Phase comparator apparatus for comparing the phase of first and second square wave signals and comprising:

a first flip-flop having a first output, a first edge-trigger input responsive to a specific type of logic transition in the signal appearing thereon for causing said output to assume a first logic state, and a second, level-trigger input responsive to a specific logic level in the signal appearing thereon for forcing said output to assume the logic state which is the logic inverse of said first logic state, regardless of the signal appearing on said first input;

a second flip-flop having a second output, a third edge-trigger input responsive to a specific type of logic transition in the signal appearing thereon for causing said output to assume a second logic state, and a fourth, level-trigger input responsive to a specific logic level in the signal appearing thereon for forcing said output to assume the logic state which is the logic inverse of said second logic state, regardless of the signal appearing on said third input;

means for directing said first signal to said first and fourth inputs and said second signal to said second and third inputs whereby said first flip-flop provides an output having first pulses having a pulse width corresponding to the amount by which said second signal lags said first

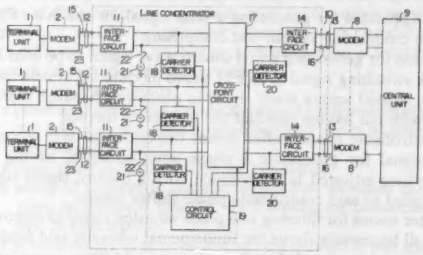
signal, and said second flip-flop provides an output having second pulses having a pulse width corresponding to the amount by which said second signal leads said first signal; and,

means responsive to said first and second output signals for providing a single phase difference signal indicating the difference in phase between said first and second signals.

4,112,260
AC TYPE LINE CONCENTRATOR

Takashi Kurokawa; Michio Fujiwara, both of Kodaira; Yoshio Akutsu, Koganei; Akoi Otani, Owariasahi; Harumi Nagasawa, Hadano; Masujiro Matsuo, Yokohama; Yasuo Ishii, Tokyo; Sigeru Ogawa, Musahino; Schun'ichi Itoh, Musashino, and Daisuke Takei, Musashino, all of Japan, assignors to Hitachi Denshi Kabushiki Kaisha; Japanese National Railways and Hitachi, Ltd., all of Japan

Continuation-in-part of Ser. No. 666,439, Mar. 12, 1976, abandoned. This application Feb. 1, 1977, Ser. No. 764,570
Claims priority, application Japan, Mar. 26, 1975, 50-35614
Int. Cl.[2] H04M *3/00*
U.S. Cl. 179—18 FC **6 Claims**



1. An ac type line concentrator for use in a data communication system including a central unit and a plurality of terminal units, comprising a crosspoint circuit composed of analog switches for disconnectably connecting m incoming lines and n ($n < m$) outgoing lines, a control circuit for applying a connection control instruction signal to said crosspoint circuit in response to the detection of a carrier frequency signal appearing on one of said incoming and outgoing lines, impedance matching means for maintaining constant the impedances of said lines irrespective of on-off operation of said analog switches in said crosspoint circuit, and means for applying the carrier frequency signal appearing on said incoming and outgoing lines to said crosspoint circuit in ac signal form without demodulating the same, whereby the carrier frequency signal can be transmitted over said incoming and outgoing lines in the ac signal form.

4,112,261
KEY TELEPHONE SYSTEM AND METHOD

Milo B. Shiff, Yorba Linda, Calif., assignor to The Anaconda Company, New York, N.Y.

Filed May 16, 1977, Ser. No. 797,490
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—99 **12 Claims**

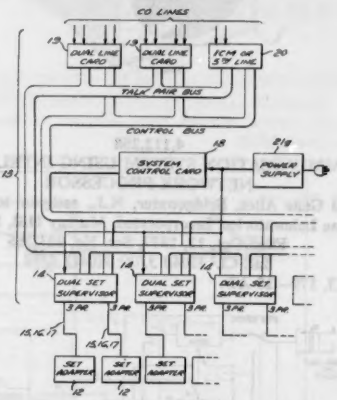
1. In a telephone system comprising a plurality of station sets, each including a plurality of finger actuated line select switches,

(a) multiple adapter units each connected with and proximate to a station set,

(b) multiple supervisory circuits to each of which at least two of said adapter units are connected via a talk pair and a control pair for each adapter unit, said circuits being remote from said adapter units,

(c) system control means connected with said supervisory circuits via a data control bus for asynchronously transmitting to each adapter unit, via said supervisory circuits, data including a start pulse causing the adapter to poll the line select and other switches in the station sets, and return the results of said polling to the system control means via the supervisory circuit in the form of a data word, following which the system control means transmits a data word corresponding to light, bell ringing or intercom bell ringing information,

(d) said system control means including clock means responsive to AC power frequency to produce a timing chain of pulses supplied to logic circuitry for controlling said data transmission and for controlling said supervisory circuits

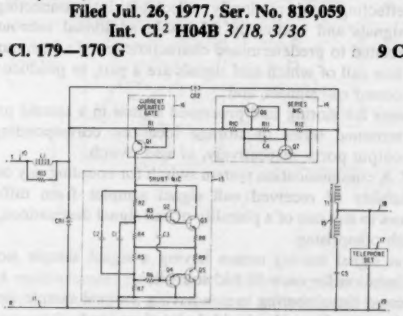


via strobe pulses, said logic circuitry also connected to be responsive to data words returned from the adapter units, the adapter units including other clock means responsive to a start pulse derived from said AC power frequency and used to produce a timing chain of pulses appropriately synchronized with the timing chain of pulses supplied to the system control means, said timing chain of pulses at the adapters being delayed relative to the timing chain pulses at the system control means to facilitate data handling at said adapter units, said delay causing a corresponding delay in said data word return to facilitate data handling at the system control means.

4,112,262
TELEPHONE STATION REPEATER

Kenneth Erwin Stiefel, Randolph Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 26, 1977, Ser. No. 819,059
Int. Cl.[2] H04B *3/18, 3/36*
U.S. Cl. 179—170 G **9 Claims**



1. A negative impedance bidirectional amplifier for insertion at the subscriber end of a telephone line, said amplifier comprising:

a shunt negative impedance converter;

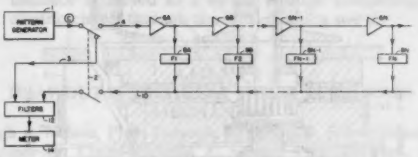
a series negative impedance converter; and
a shunt autotransformer;
said negative impedance converters and said autotransformer being connected in a π configuration with respect to said telephone line.

4,112,263

MODIFIED DUOBINARY REGENERATIVE REPEATER TESTING ARRANGEMENT

Adam Lender, Palo Alto, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 6, 1977, Ser. No. 785,132
Int. Cl.[2] H04B *3/46, 1/60*
U.S. Cl. 179—175.31 R **10 Claims**



1. An arrangement for remotely testing, from a test location, the transmission characteristics of modified duobinary regenerative repeaters in situ in a repeatered line, said remote testing arrangement comprising:
means for generating a modified duobinary pulse test pattern composed of repetitious patterns of pulses, each said test pattern characterized by the presence of two pulses of one state followed by two pulses of the opposite state, which is followed by two pulses of said one state, said generating means comprising: means to vary the repetition rate of said test patterns, thereby changing the pulse density, and means to invert the polarity of the pulses in the pattern at any one of a number of predetermined rates, thereby generating one of a number of predetermined audio frequencies, one said predetermined audio frequency for each repeater location, said generating means having an output;
means for transmitting the predetermined audio frequency from the output of a repeater to said test location, said transmitting means having an output;
means for measuring the amplitude of the predetermined audio frequency, said measuring means having an input; and
means for selectively and simultaneously connecting the output of said pulse pattern generator to said repeatered line and said transmitting means to the input of said measuring means, and for selectively and simultaneously connecting the output of said pulse pattern generator to the input of said measuring means and disconnecting said transmitting means therefrom.

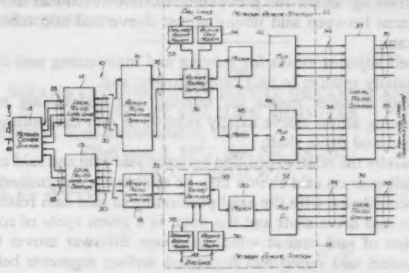
4,112,264

TESTING AND SWITCHING SYSTEM INCLUDING REMOTELY CONTROLLABLE STATIONS FOR INFORMATION TRANSMISSION AND COMMUNICATIONS NETWORKS AND SYSTEMS

Carl N. Abramson, Bridgewater, N.J.; David Kohl, Brooklyn, N.Y., and Thomas Ogen, Corona, N.Y., assignors to Bowne Time Sharing, Inc., New York, N.Y.

Filed Dec. 28, 1976, Ser. No. 755,010
Int. Cl.[2] H04B *3/46*
U.S. Cl. 179—175.3 R **78 Claims**

1. Testing apparatus for information transmission systems including a one system station and at least another system station located remotely from the system station for performing tests related to information transmission between one system station and the remote station, the one system station and the remote system station being connected by a transmission link, comprising:
(a) receiving means disposed at the remote station for receiving from the one system station independently of the transmission link there between a plurality of different predetermined command signals each adapted to initiate the testing apparatus to conduct a different one of a plurality of predetermined tests related to the transmission of information over the transmission link;
(b) control means disposed at the remote station for providing a plurality of different control signals in response to different predetermined command signals from the one system station;



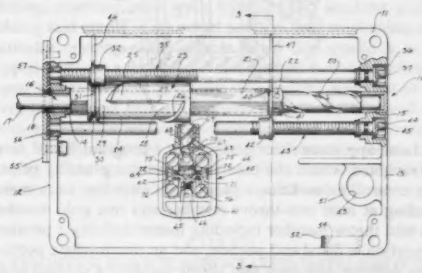
(c) a plurality of circuits disposed at the remote station for processing in response to said control signals other signals related to the information transmission between the one system station and the remote station, the processing being related to the performance of at least one predetermined test; and
(d) test result signal means disposed at the remote station for deriving test result signals in response to processing of the other signals related to the information transmission by said plurality of circuits in the performance of a predetermined test.

4,112,265

ROTATABLE CAM LIMIT SWITCH WITH VARIABLE TIMING AND DWELL

Robert G. Crepeau, and Thomas G. Karakis, both of Greendale, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 28, 1977, Ser. No. 772,707
Int. Cl.[2] H01H *19/00, 3/16*
U.S. Cl. 200—31 R **11 Claims**



1. A rotatable cam limit switch comprising in combination:
a housing member;
an electric switch in said housing and including a movable contact member and a cam follower arranged to move said contact member from a first operating position to a second operating position;
a drive shaft rotatably supported in said housing member;
a timing adjust sleeve circumjacent to said shaft and in

threading engagement with said shaft for axial adjustment relative to said cam follower and said drive shaft;

an elongated, generally cylindrical, tubular cam having a bore receiving the external surface of said timing adjust sleeve and arranged for axial movement therealong and rotation therewith,

said cam having a raised circumferential surface segment and a depressed circumferential surface segment, each segment extending substantially lengthwise of said cam and partially about the exterior thereof with the peripheral extent of each said segment varying from maximum to minimum between its ends, the surface segments of said cam means engaging said cam follower;

restraining means for preventing relative rotational movement between said timing adjust sleeve and said tubular cam;

dwell adjuster means for moving and maintaining said cam axially relative to said cam follower; and

timing adjuster means for moving and maintaining said timing adjust sleeve axially relative to said cam follower and said drive shaft;

whereby the relative position between said cam and said cam follower on said switch may be selectively determined in accordance with the axial positioning of said cam relative to said drive shaft and the point in a given cycle of rotation of said cam at which said cam follower moves between said raised and depressed surface segments being selectively variable in accordance with the combined rotational adjustment of said cam and said sleeve relative to said drive shaft.

4,112,266

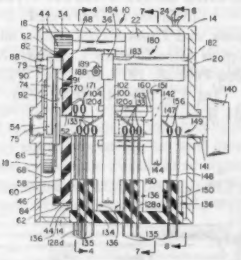
APPLIANCE TIMER WITH CONTACT MOUNTING FOR FLEXIBLE CONTACTS

Wallace Leon Linn, 6705 Grosvenor Pl., Indianapolis, Ind. 46220

Continuation-in-part of Ser. No. 647,791, Jan. 9, 1976, Pat. No. 4,060,702. This application Feb. 23, 1977, Ser. No. 771,406

Int. Cl.[2] H01H *43/00, 1/24*

U.S. Cl. 200—38 C 21 Claims



1. In an appliance timer comprising a program wheel rotatably mounted within the timer and having a plurality of program controlling surfaces, a plurality of switches, each switch including at least one throw member and one pole member, each said throw member including means defining a proximal end portion, a distal end portion, and an intermediate portion, means defining one each said throw member a contact and a controlling surface follower, each follower responsive to one of said program controlling surfaces for controlling said throw member, the improvement comprising a terminal block for mounting said throw members, the block including a portion for rigidly holding a proximal end portion of each said throw member, the block further including means for defining channels for maintaining alignment and spacing between said throw members during timer operation, said channels extending longitudinally of said throw members, each said channel cooperating with the intermediate portion of one of said throw members.

4,112,267

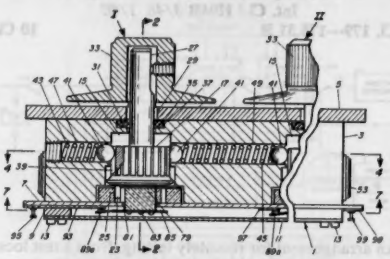
CODED SWITCHING DEVICE

Roy A. Zangrando, Lake Hiawatha, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 18, 1976, Ser. No. 715,278

Int. Cl.[2] H01H *27/06*

U.S. Cl. 200—43 9 Claims



1. A coded switching device comprising at least one switch, each switch including:

stationary contact means;

rotatable contact means having a fixed number of angular orientations, in only one of which said contact means completes an electrical path through said switch;

rotatable actuating means coaxial with said rotatable contact means and including indicia means for indicating its angular orientation;

means for selectively engaging said actuating means with said rotatable contact means in any angular relation thereto; said actuating means being disengagable from said rotatable contact means to permit changing said angular rotation; and

means for preventing said disengagement unless said rotatable contact means is in a particular angular orientation.

4,112,268

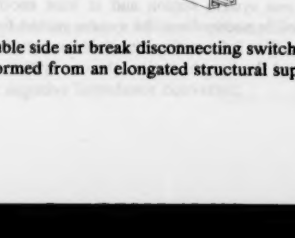
DOUBLE SIDE AIR BREAK DISCONNECTING SWITCH

Asuncion Chung, Hoffman Estates, Ill., assignor to H. K. Porter Company, Inc., Chicago, Ill.

Filed Dec. 1, 1976, Ser. No. 746,380

Int. Cl.[2] H01H *31/02*

U.S. Cl. 200—48 SB 28 Claims



1. A double side air break disconnecting switch comprising:

a base formed from an elongated structural support;

a first insulator, which is stationary, connected in proximity to one end of said base;

a second insulator, which is stationary, connected in proximity to the other end of said base;

a third insulator, supported for rotary movement around its longitudinal axis from said base intermediate said first and second insulators;

an elongated blade rigidly secured intermediate its ends to said third insulator for unitary movement therewith;

a pair of jaw contacts, one being connected to each end of said elongated blade and each defining a bifurcated portion; and,

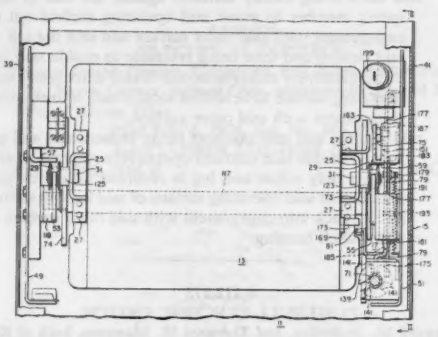
a pair of contact bars, one supported on said first insulator and the other supported on said second insulator disposed to be engaged by said pair of jaw contacts when said third insulator is moved to a closed position completing an electric circuit through the disconnecting switch.

4,112,269

DRAWOUT SWITCHGEAR WITH LEVERING-IN MECHANISM

Hugh A. Nelson, Plum Borough; Raymond H. Schweinebraten, Upper St. Clair; Nicholas A. Salemi, Plum Borough, and James O. Rexroad, Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 5, 1977, Ser. No. 757,102
Int. Cl.[2] H01H *9/20*
U.S. Cl. 200—50 AA **11 Claims**



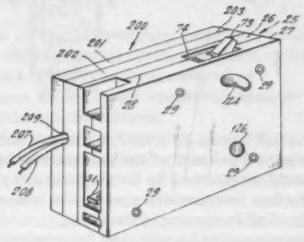
1. Drawout switchgear comprising a cell having a front opening, a circuit interrupting unit movable into and out of the cell, stationary primary terminal means supported in the cell, movable primary terminal means on said unit, retractable secondary contact means and movable secondary contact means movable into and out of contact with each other, one of the retractable contact means and movable secondary contact means being mounted on the circuit interrupter, the other of the retractable contact means and movable secondary contact means being on the cell, a levering-in mechanism mounted on the cell for moving said unit between disconnected, intermediate, and connected positions of said terminal and contact means, the levering-in mechanism comprising an operating shaft supported for rotation about an axis that extends generally in the direction of movement of said unit, the operating shaft comprising a threaded part, a travelling nut on the threaded part, a cam pivotally mounted on the cell and operatively connected to the nut for rotating the cam reversely between two positions corresponding to the disconnected and connected positions, the cam being rotatable in a plane parallel to the direction of movement of said unit, the cam having a slot including an open end at the cam periphery, the slot having outer and inner camming segments, the angles of directions of the segments with respect to the angle of rotation of the cam being such that the mechanical advantage of the outer segment is greater than that of the inner segments, a cam pin on said unit and movable into and out of the cam slot for movement of said unit between the disconnected, intermediate, and connected positions, said terminal means being disengaged in the disconnected and the intermediate positions and being engaged in the connected position, said contact means being disengaged in the disconnected position and being engaged in the intermediate and connected positions, during the movement of the unit between the disconnected and the intermediate positions the cam pin moving along the outer segment of the cam slot, during movement of the unit between the intermediate and connected positions the cam pin moving along the inner segment, so that for a constant speed of rotation of the operating shaft said unit moves faster between the intermediate and the disconnected positions than between the connected and intermediate positions.

4,112,270

MEANS CONNECTING CIRCUIT BREAKER AND AUXILIARY FEATURE MODULES

Tadeusz J. Rys, Bellefontaine, Ohio

Filed Sep. 2, 1977, Ser. No. 830,312
Int. Cl.[2] H01H *9/26*
U.S. Cl. 200—50 C **10 Claims**



1. Electrical circuit controlling apparatus comprising a circuit breaker including cooperating movable and stationary contacts; a contact arm carrying said movable contact, latch pivot means pivotally mounting said contact arm for movement between contact open and closed positions, an operating mechanism connected to said contact arm for opening and closing said contacts, said mechanism including a releaseable cradle and cradle pivot means pivotally mounting said cradle for movement between reset and tripped positions, said mechanism also including a latch and latch pivot means pivotally mounting said latch for movement between latching and unlatching positions, said latch when in said latching position holding said cradle in said reset position, said mechanism automatically opening said contacts when said cradle is in said tripped position; a first of said pivot means including a first pin keyed to the element pivotally mounted by said first of said pivot means; said first pin including an axially disposed connecting means for making an operative mechanical connection to an axially disposed cooperating connecting means on a bearing of an operator for an auxiliary feature which is to operate in conjunction with said circuit breaker.

4,112,271

COUNTER DEVICE ASSOCIATED WITH SWITCH ACTUATOR OF ELECTRICAL SHAVER TO DETERMINE BATTERY RECHARGING AND USE

Michael John Marchetti, Bridgeport, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

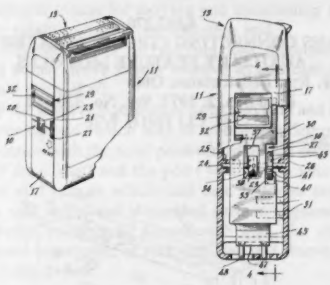
Filed Dec. 20, 1976, Ser. No. 752,491
Int. Cl.[2] H01H *35/00;* B26B *19/02*
U.S. Cl. 200—52 R **12 Claims**

1. A counter for visually indicating to the user the number of prior uses of a battery operated appliance including a casing having a display opening formed therein, a switch within the

casing for establishing an electrical circuit between batteries and appliance output means, said counter comprising;

a. an elongated slide member provided with a dial opening and slidably disposed against an inner surface of the casing for sliding movement between spaced limit positions for selectively operating the switch and including actuator means operable from outside the casing to effect said sliding movement,

b. an indicia dial attached to a shaft having opposite ends thereof rotatably mounted in trunnions formed on inner walls of the casing, said dial having a portion thereof disposed in the dial opening of the slide member and having numerals inscribed serially on the periphery of said portion of the dial,



c. ratchet means formed on said slide member and said dial operable upon movement of the slide member to a first of said spaced limit positions for rotating said dial a predetermined distance to expose the next highest numeral on the dial in the display opening in the casing,

d. reset means mounted on said shaft for rotation therewith and operable from outside the casing through a second opening formed in the casing for resetting the dial to an initial start position, and

e. detent means formed on said slide member and said reset means operable for detenting and holding said dial in said first limit position of the slide member upon rotation of the dial.

4,112,272

VALVE AND SWITCH DEVICE FOR MEASURING PRESSURE OF LIQUIDS IN LIVING OBJECTS

Sven Erik Jonsson, Kungsängen, and Olov Valter Ekström, Brottby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 744,833, Nov. 24, 1976, abandoned, which is a continuation of Ser. No. 607,862, Aug. 25, 1975, abandoned, which is a continuation of Ser. No. 439,618, Feb. 4, 1974, abandoned. This application Jun. 21, 1977, Ser. No. 808,703

Int. Cl.[2] H01H *9/06*; A61B *5/02*

U.S. Cl. 200—61.58 R **2 Claims**

1. An electro-mechanical switch and valve mechanism for use in a pressure measuring device comprising

an axial valve having a plurality of ports radially angularly arranged thereabout,

an electrical switch having an axial housing connected in fixed assembly to said valve and in axial alignment therewith,

a plurality of magnetically responsive encapsulated insulated switch contacts located within said switch housing in stationary relation thereto and in radially angularly spaced relation with respect to the axis thereof,

electrical conductors connected to said switch contact and extending through said switch housing,

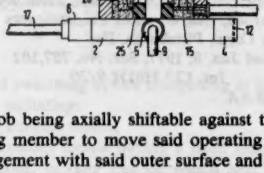
a rotatable and axially shiftable actuating member having a knob disposed outside said switch housing and an axial stem means extending into switch housing and into said valve,

said stem means being operative to open and close said ports upon rotation thereof,

said knob having a radial operating surface,

said switch housing having a radial outer surface facing said operating surface and having disposed therewithin a spring member for biasing said operating surface axially into abutting engagement with said outer surface, and a magnet located in said knob for joint rotation therewith,

said operating surface and said outer surface having axially extending cooperating lug and detent means formed thereon including a lug and a plurality of radially angularly spaced detents for receiving said lug,



said knob being axially shiftable against the bias of said spring member to move said operating surface out of engagement with said outer surface and said lug out of said detents and then being rotatable to enable said lug to be selectively received in one of said detents and said operating surface to be shifted axially back into abutting engagement with said outer surface,

said magnet and said contacts being constructed and arranged so that said contacts operatively respond to said magnet only when said lug is received in one of said detents and said operating surface of said knob is shifted axially back into engagement with said outer surface of said switch housing.

4,112,273

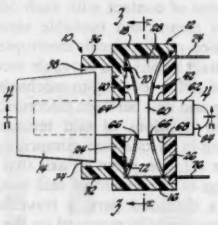
PUSH-PULL ELECTRIC SWITCH

Edward M. Arakelian, and Terrance W. Maugans, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1977, Ser. No. 846,422

Int. Cl.[2] H01H *15/18, 15/24*

U.S. Cl. 200—67 D **3 Claims**



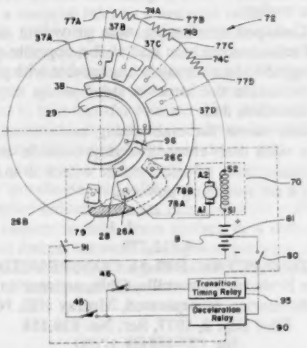
1. A push-pull electric switch comprising a housing having a chamber defined by interconnected top, bottom and side walls and a front wall and a rear wall, front and rear spring contact plates located in said chamber, each of said contact plates being spherically shaped and having a plurality of leg portions formed therewith, the convex surfaces of the contact plates facing each other and each of said contact plates having an aperture centrally formed therein, the front wall of said hous-

ing having an opening therein which is axially aligned with the apertures in each of said contact plates, an actuator in the form of a rod having an inner portion extending into said housing through the opening in the front wall and the apertures in each of said contact plates, said actuator having an outer portion located exteriorly of said housing, an enlarged member rigidly formed with said inner portion and located between said contact plates and being of a size greater than the size of each aperture in said contact plates so that the latter normally biases said actuator to a neutral position, a pair of contact tabs formed with each of said contact plates, and a pair of stationary contact members carried by said front wall and said rear wall and located opposite to the pair of contact tabs formed with the associated contact plate whereby axial movement of the actuator in one direction causes the member to flex the rear contact plate towards the rear wall so that the contact tabs thereof engage the contact members on the rear wall while axial movement of the actuator in a direction opposite to said one direction causes the member to flex the front contact plate towards the front wall so that the contact tabs thereof engage the associated contact members mounted on the front wall.

4,112,274
ELECTRICAL CONTROL

Chester Joseph Pigman, Uniontown, and James Arthur Pewton, Sr., North Canton, both of Ohio, assignors to General Power Corp., Akron, Ohio

Filed Feb. 4, 1976, Ser. No. 655,251
Int. Cl.² H01H *3/00*; H01F *29/04*
U.S. Cl. 200—146 R **40 Claims**

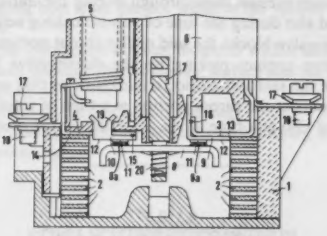


1. An electrical control apparatus comprising, mounting means, a plurality of discrete load contact means disposed in fixed relation on said mounting means and connected with differing magnitudes of impedance, power contact means movable relative to said discrete load contact means for permitting continuously progressive, sequential engagement therewith, transition contact means connected to each of said discrete load contact means prior to engagement by said power contact means, and transition circuit means providing a maintainable full load alternate current path through said transition contact means and each of said plurality of discrete load contact means prior to engagement of said discrete load contact means by said power contact means, thereby providing a graduated change in the magnitude of electrical energy transfer substantially without arcing between said contact means.

4,112,275
CONTACT STRUCTURE FOR ELECTRICAL SWITCHING APPARATUS

Helmut Kohler, Amberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Germany

Continuation of Ser. No. 453,401, Mar. 21, 1974, abandoned. This application Jul. 8, 1976, Ser. No. 703,583
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1973, 7311345[U]
Int. Cl.² H01H *33/20*
U.S. Cl. 200—147 R **4 Claims**



1. In an electric switching apparatus including stationary and movable electrical contacts disposed within a housing, an improved contact structure, comprising:

a planar electrical arc conducting member constructed of ferromagnetic material;

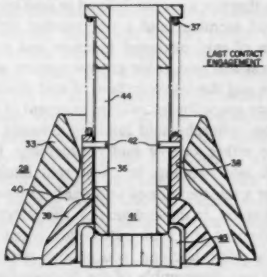
an electrical contact member, disposed on one side of said electrical arc conducting member for engagement with an opposing contact of said switching apparatus, and constructed of non-magnetic material; and

an electrical line conductor disposed flat on the other side of said electrical arc conducting member and electrically connected to said arc conducting member at a point away from said electrical contact member, said line conductor, said electrical connection between said electrical line conductor and said electrical arc conducting member, and said electrical arc conducting member comprising a coupling arrangement forming a current conducting loop for inducing travel of electrical arcs.

4,112,276
COMPRESSED-GAS CIRCUIT-INTERRUPTER HAVING A SLEEVE-VALVE FOR TEMPORARILY BLOCKING THE ORIFICE THROAT

Charles F. Cromer, Level Green-Penn Township, Allegheny County; Kue H. Yoon, Pittsburgh, and Willie B. Freeman, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1976, Ser. No. 727,510
Int. Cl.² H01H *33/88*
U.S. Cl. 200—148 R **13 Claims**



1. A compressed-gas circuit-interrupter including a pair of separable contacts separable to establish an arc during the

opening operation of the circuit-interrupter, means defining a hollow insulating orifice structure having an inner throat portion through which said established arc is drawn, a sleeve-valve surrounding one of said separable contacts rendering it captive and having a lost-motion mechanical connection therewith, means biasing said sleeve-valve to an extended position relative to said captive contact wherein it, together with its inner-disposed captive contact, substantially blocks the flow of compressed gas through said throat portion in the closed-circuit position of the device, at least one of said separable contacts being vented so that hot, ionized, products of decomposition may exhaust therethrough during the initial stage of arcing and also during the time of valve-blocking action, while the sleeve-valve blocks the said orifice throat portion, and the said captive contact picking up the sleeve-valve following take-up of the said lost-motion connection, so that unblocking action occurs at the throat portion at a time of substantial arc length and also at a time when arc extinction is possible.

4,112,277
PUSH-BUTTON SWITCH UNITS

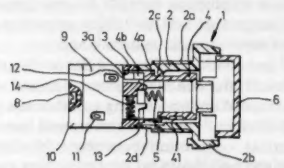
Markus Kleeb, Reinach, Switzerland, assignor to Tschudin & Heid AG, Switzerland

Filed Aug. 25, 1976, Ser. No. 717,691

Claims priority, application Switzerland, Aug. 29, 1975, 11235/75

Int. Cl.² H01H 3/14

U.S. Cl. 200—153 J **5 Claims**



1. A push-button unit comprising, in combination, a sleeve member having a longitudinal axis; a push-rod member mounted to be axially displaceable in said sleeve member between an outer position and an inner position; a guide groove system defined in a surface portion of said push-rod member; a latching element mounted on said sleeve member to extend internally thereof, said guide groove system being engageable by a portion of said latching element, responsive to said push rod being displaced to said inner position, thereby to latchably retain said push-rod in said inner position and, responsive to renewed pressure being applied to said push-rod, to allow said push-rod to return to said outer position; an opening provided in said sleeve member in the vicinity of said latching element to provide access thereto; a recess defined in said surface portion of said push-rod member; and a rib member defined in said surface portion of said push-rod member and extending between said recess and said guide groove system; said push-rod surface portion and the inner surface of said sleeve defining a free intermediate space for lateral displacement of said latching element portion; whereby said latching element is selectable positionable on either side of said rib member, by a tool inserted through said opening, to cause said latching element portion to enter a selected one of said guide groove system and said recess; whereby, in dependence on the selected setting of said latching element said push-button unit is ready for operation selectively with latching action and without latching action without any disassembly of the components of the unit or displacement of any such components except said latching element.

4,112,278
PUSH BUTTON SWITCH

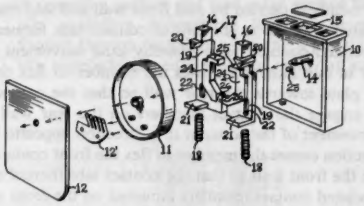
Günter Greiner, Bayreuth, and Günter Murmann, Neuses, both of Fed. Rep. of Germany, assignors to Cherry Electrical Products Corp., Waukegan, Ill.

Filed Oct. 26, 1977, Ser. No. 845,489

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653172

Int. Cl.² H01H 3/34, 13/58

U.S. Cl. 200—156 **7 Claims**



1. In a multiple-position push-button rotary switch having switch contacts movable in either direction through a plurality of switch positions and housed within an open-sided hollow case, the combination comprising

(a) a rotatable ratchet wheel carried by a switch position indicator mounted for rotation within the switch housing,

(b) a pair of independent actuators diametrically disposed on opposite sides of the axis of said ratchet wheel and mounted for independent reciprocal linear movement within said housing into and out of tangential contact with said ratchet wheel,

(c) each of said actuators providing an elongated flat plate having an uninterrupted surface on one side thereof for facial displacement against one side wall of said housing, and a substantially C-shaped reinforcing area on the opposite side surface,

(d) said C-shaped reinforcing area providing at one end thereof an actuating cam and at the opposite end a stop cam adapted to be alternately engageable with said ratchet wheel to rotate the same in step-by-step movement in either direction, and

(e) yieldable means for maintaining said actuators in one position with their respective stop cams in engagement with certain teeth of said ratchet wheel to maintain the same in a set switching position.

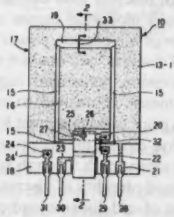
4,112,279
PIEZOELECTRIC RELAY CONSTRUCTION

Ivan Eugene Brohard, Westerville, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 2, 1977, Ser. No. 830,154

Int. Cl.² H01H 57/00

U.S. Cl. 200—181 **13 Claims**



1. A piezoelectric switch device comprising a bimorph sheet

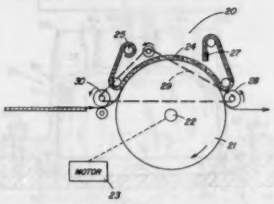
comprising layers of material exhibiting piezoelectric properties, each having electrodes comprising metallic surface coatings thereon, and an electrode comprising a conductive centervane, said sheet having a substantially "U" shaped perforation therethrough to present an armature member having a moveable free end within the boundaries of said sheet, a first electrical contact mounted on said free end of said armature member, a conductive clip member mounted on said sheet, and a second electrical contact mounted on said clip member in opposition to and spaced apart from said first contact.

4,112,280

THERMAL PROCESSOR

Robert Charles Salsich, Canandaigua, and Roger Edwin Bartell, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 28, 1977, Ser. No. 819,797
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **7 Claims**



1. Apparatus for thermal development of imaging material, said apparatus comprising:

(a) a development drum mounted for rotation on a central axis, said drum having a peripheral surface with a low coefficient of friction;

(b) means for rotating said drum;

(c) means for heating said drum surface;

(d) means providing a stationary, low-coefficient-of-friction, support surface extending around a portion of said drum from a material inlet to a material outlet;

(e) means for urging said support surface toward the successive portions of the drum surface moved therepast, the force provided by said urging means being sufficient to maintain material between said drum and said support surface in heat transfer relation with said drum but insufficient to create any substantial drive transmission forces between such material and said drum; and

(f) first and second drive-inducing means located respectively proximate said inlet and said outlet, at least one of said drive-inducing means being an idler roller mounted with respect to said drum surface in a manner creating normal forces, between contiguous portions of said roller and drum surface, of magnitude effecting transport by said drum of interposed material.

4,112,281

COMBINED WATER HEATER AND SAUNA ROOM HEATER DEVICE

L. Macon Epps, Huntington, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 8, 1976, Ser. No. 674,771
Int. Cl.[2] F24D *3/08*; F24H *1/18*; A61H *33/06*; H05B *1/00*
U.S. Cl. 219—283 **4 Claims**

1. In combination with a sauna room, a combined domestic hot water and sauna room heater device mounted in said sauna room, said device comprising

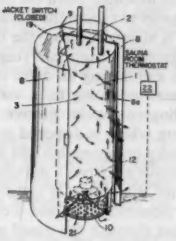
a domestic hot water heating unit including a water tank having a top, sides and a bottom and leg means supporting the tank with its bottom at a predetermined distance above a supporting surface in said sauna room, said tank having a cold water inlet means and a hot water outlet for connection to a domestic hot water system of a building, said tank including thermostatically controlled heating means for heating the water therein to a predetermined temperature;

a split jacket of substantially rigid thermal insulation movably mounted about the tank and selectively covering the top and sides of the tank and extending to the supporting surface, said jacket being selectively movable between a closed position completely enclosing and insulating the tank and an open position exposing part of the top, sides and bottom of the tank and part of the area between the supporting surface and the bottom of the tank, the exposed part of the tank serving as a heat exchange surface for radiating heat from the hot water in the tank to the sauna room;

a separate perforated housing mounted within said jacket in the area between the supporting surface and the bottom of the tank;

sauna rocks in the perforated housing;

electric heating means in the perforated housing for heating the sauna rocks;



electric fan means mounted in said area for directing heated air via forced draft from the housing upward past the exposed part of said tank to pick up additional heat therefrom and thence into the sauna room;

circuit means including switch means and a thermostat means responsive to sauna room temperature, said switch means and thermostat means being electrically connected to the heating means and the fan means to energize the heating means and fan means when the switch means is closed and when said sauna room is below the desired temperature for maintaining desired sauna room temperature under the control of said thermostat means, said switch means being coupled to the jacket in a manner whereby when the jacket is moved to its open position said switch means is automatically closed to energize the electric heating means and fan means, said switch means being open when said jacket is in its closed position; and

selectively operable means associated with said tank for supplying water from the tank to the heated rocks in the perforated housing for generating steam in the sauna room.

4,112,282

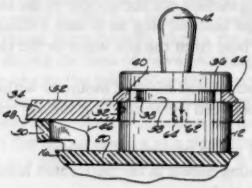
SNAP-IN MEANS FOR MOUNTING ELECTRICAL DEVICES OR THE LIKE IN A SUPPORT PANEL APERTURE

Earl T. Piber, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Division of Ser. No. 638,811, Dec. 8, 1975, Pat. No. 4,070,559. This application Aug. 26, 1977, Ser. No. 827,856

Int. Cl.[2] H01H *9/02*

U.S. Cl. 200—296 **7 Claims**



1. A snap-in mounting means for a device adapting the device to be mounted from the back of and through a hole in a support panel to secure the device to the panel so that part of the device is accessible from the front of the panel comprising

an elongated bushing carrying the accessible part of the device and having an outer end portion to be received in the panel mounting hole, said bushing outer end portion including an annular groove,

a split ring which is disposed in said bushing groove, which is radially compressible and expandable within said bushing groove between a normally expanded position where its outer dimension is larger than the dimension of the panel mounting hole and a compressed position where it can pass through the panel mounting hole, and which is adapted to engage the back rim of the panel mounting hole and be cammed thereby to said compressed position as said bushing outer end portion is inserted into the hole during mounting, said split ring returning to its normally expanded position, where at least a portion thereof overlies the front of the support panel in the area surrounding the mounting hole, after said bushing outer end portion has been inserted through the mounting hole,

and a plurality of circumferentially spaced spring fingers extending inwardly from the inner periphery of said ring and bearing against the inner wall of said bushing groove to evenly space said ring from said groove inner wall when said ring is in said expanded position,

biasing means adapted to urge said bushing in an axial direction away from the back of the support panel and thereby hold said split ring in tight engagement with the front of the support panel after mounting.

4,112,283

DISTRIBUTOR CAP AND DUST SHIELD WITH HERMETIC SEALING AND MOISTURE DETECTION APPARATUS

James Lathrop, Rte. #1, Wayne City, Ill. 62895

Filed Mar. 18, 1977, Ser. No. 779,062

Int. Cl.[2] H01H *19/06;* **B65D** *81/26*

U.S. Cl. 200—302 **24 Claims**

1. A spark ignition distributor cap assembly comprising in combination:

A. a distributor cap comprising a cup-shaped member having an interior defined by an inner surface and an exterior defined by an outer surface with a circumferentially extending lower end intermediate said surfaces,

B. a base having a circumferentially extending upper end adapted to receive said lower end of said distributor cap in overlapping relationship therewith,

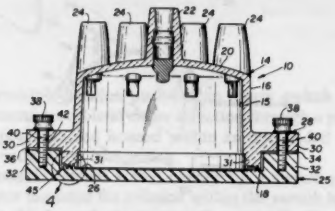
C. coupling means for removably securing said cap to said base during use of the ignition cap assembly,

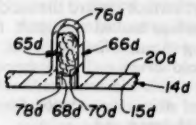
D. sealing means operatively associated with said cap and said base to provide a multiple barrier therebetween so as to prevent liquid such as road water splash or the like from entering the interior of said cap,

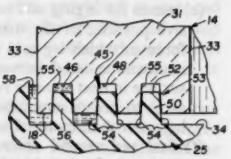
E. said sealing means comprises:

(1) a plurality of circumferentially extending concentrically formed grooves on said cap, each one of said grooves having an inner end terminating below said lower end of said cap, and

(2) a plurality of circumferentially upwardly extending annular ribs formed on said base, each one of said ribs concentrically formed relative to each other and having a terminal end above said upper end of said base, said ribs adapted to extend in interfitting relationship with each other when said coupling means secures said cap and said base in assembled relationship to each other,







F. engaging means operatively associated with each one of said ribs and said grooves, said engaging means comprising inclined surfaces on said ribs and said grooves for abutting engagement therebetween, each one of said corresponding pair of inclined surfaces of each one of said mating ribs and grooves providing sealing engagement therebetween such that a liquid barrier is obtained,

G. detecting means operatively associated with said cap for indicating by visual means the moisture condition of the air within said cap when assembled with the base, said detecting means comprises a chemical compound that changes its color when hydrated or percipitated,

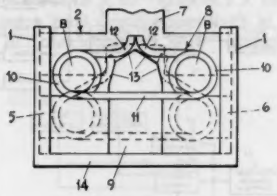
H. housing means mounted on said cap for receiving said detecting means therein, and

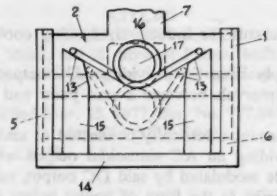
J. said housing means being contained on said inner surface and includes an aperture adapted to receive said detecting means therein.

4,112,284
FALL-THROUGH RETURN SPRING ARRANGEMENT FOR A PUSH-BUTTON SWITCH MECHANISM

John Harwood Leworthy, Newton Aycliffe, England, assignor to The General Electric Company Limited, London, England

Filed Aug. 20, 1976, Ser. No. 716,155
Claims priority, application United Kingdom, Aug. 22, 1975, 34934/75
Int. Cl.[2] H01H *3/12*
U.S. Cl. 200—340 7 Claims





1. A push-button switch mechanism for linearly actuating a set of switch contacts, said switch mechanism including:

(A) a housing,

(B) a push button,

(C) means mounting said push-button for substantially linear motion with respect to said housing, and

(D) a return-spring arrangement to provide substantially the sole restoring force acting between the push-button and the housing and tending to reverse said linear motion, said arrangement consisting of:

(I) a first means presenting a ramp surface having a first portion inclined at a first angle to said direction of motion and a second portion inclined to said direction of motion at a smaller angle than said first angle, and

(II) second means including a spring of which part is arranged to bear successively during said linear motion firstly upon said first portion of said ramp surface to provide an increasing restoring force as said linear motion progresses and secondly upon the second portion of said ramp surface to provide a lesser value of restoring force due to a smaller angle at which said second portion is inclined to said direction of motion, one of said first and second means being secured to said push-button and the other of said first and second means being secured to said housing.

4,112,285
INDUCTION HEATING USING PARALLEL ELECTRIC/MAGNETIC FIELDS

Peter N. Y. Pan, Country Club Hills, and Steve F. Wronski, Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

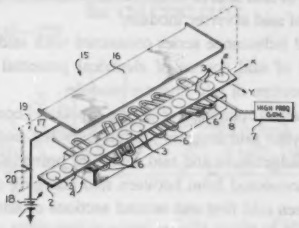
Filed Mar. 14, 1977, Ser. No. 776,840
Int. Cl.[2] H05B *5/06*
U.S. Cl. 219—10.41 33 Claims

26. A method of counteracting tear-away forces while fusing substrates having charged powder particles deposited thereon, comprising the steps of:

(a) conveying said substrates along a predetermined path;

(b) providing at least one induction heater coil adjacent to said predetermined path;

(c) applying high frequency current to said at least one



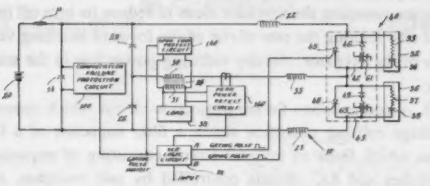
induction heater coil so as to fuse said substrates, while imposing on said powder particles a tear-away force in a direction away from said predetermined path; and

(d) applying a DC electric field to said substrates so as to impose a counter-force on said powder particles in a direction toward said predetermined path, whereby to counteract said tear-away force.

4,112,286
POWER CIRCUIT FOR INDUCTION HEATING

Arnold N. Alderman, Stratford, Conn., and Shashi B. Dewan, Toronto, Canada, assignors to Firing Circuits, Inc., Norwalk, Conn.

Filed Jun. 28, 1976, Ser. No. 700,601
Int. Cl.[2] H05B *5/04*
U.S. Cl. 219—10.41 10 Claims



1. A high voltage, induction heating, power circuit for supplying a high current to a load, said power circuit comprising:

a. a source of electrical potential having a positive and a negative terminal;

b. an inverter module in series with said source of electrical potential, said inverter module being comprised of a first section and a second section, each of said sections being comprised of

1. at least one thyristor gatable to conduct in a first direction

2. at least one diode means connected in parallel with said thyristor and conducting in the opposite direction, so that alternate current paths through said inverter module section are provided,

3. a saturable reactor in series with said diode means, said saturable reactor placing a reverse voltage across the thyristors when the diode means begins conduction, said saturable reactor also limiting the rate of rise of the voltage across said respective thyristor when said thyristors have turned off, and

4. a snubber connected in parallel with said thyristor, said snubber being comprised of a series connected resistor and capacitor and operating to limit the rate of rise of voltage across the thyristor when said thyristor has turned off;

c. an SCR logic circuit for selectively providing gating pulses to said thyristors of said inverter module, each of said thyristors becoming conductive when receiving a gating pulse;

d. a first inductance series connected with said positive terminal of said source of electrical potential and said first section of said inverter module;

e. a second inductance series connected with said negative terminal of said source of electrical potential and said second section of said inverter module;

f. a pair of series connected charging capacitors connected in parallel with said inverter module between said first and second inductances and said source of potential;

g. a load connected from between said charging capacitors to between said first and second sections of said inverter module;

whereby said power circuit is in operation, current flows through one current path of said first section of said inverter module, through said load and through said series capacitors thereby charging them, said capacitors then discharging and sending current back through said load and through said alternate current path in said first section of said inverter module, the operation then being repeated with said second section of said inverter module, and whereby when the SCR logic circuit provides gating pulses at sufficiently high frequency, said thyristor of said second section begins conduction while said diode means of said first section is still conducting, thereby diverting current from the alternate current path in said first section to the thyristor current path of said second section, the operation then being repeated with the said second section of said inverter module, the snubber limiting the rate of rise of the forward blocking voltage of the thyristor and the saturable reactor sweeping the thyristor clean to reduce its turn off time and also limiting the rate of rise of the forward blocking voltage of the thyristor, thereby reducing power loss in the snubber.

4. A commutation failure protection circuit which senses a voltage collapse condition across a filter capacitor of a DC buss which feeds an inverter circuit consisting of sequenced switches and LC circuits controlled by said switches, and which provides direct current transfer while maintaining voltage isolation from said inverter module where the voltage collapse occurs, said commutation failure protection circuit comprising a Hall device whose output voltage is proportional to its input current, means for comparing the output voltage of said Hall device with a selectively set voltage and means for sending an output signal from said commutation failure protection circuit depending upon the magnitude of the output voltage of said Hall device in comparison with said set voltage.

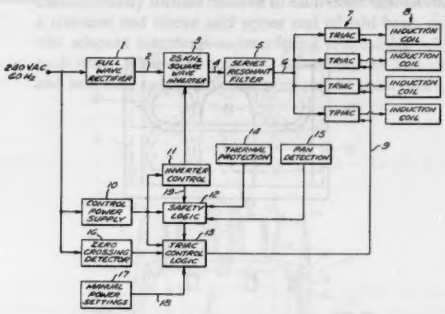
5. An improvement in a circuit comprising a gated thyristor conducting in a first direction and a diode connected in parallel with the thyristor and conducting in a second direction to provide alternate current paths occuring at high frequency, the improvement comprising a saturable reactor in series with the diode and a snubber in parallel with the thyristor, the snubber comprising a series connected resistor and capacitor operating to limit the rate of rise of the forward blocking voltage of the thyristor when the circuit is conducting in the second direction and the saturable reactor sweeping the thyristor clean to reduce its turnoff time and also limiting the rate of rise of the forward blocking voltage of the thyristor, thereby reducing power loss in the snubber.

4,112,287

CENTRAL OSCILLATOR FOR INDUCTION RANGE USING TRIAC BURNER CONTROLS

Robert M. Oates, and Theodore M. Heinrich, both of Murrysville, Pa., assignors to White-Westinghouse Corporation, Pittsburgh, Pa.

Filed Nov. 4, 1976, Ser. No. 738,904
Int. Cl.² H05B 5/04
U.S. Cl. 219—10.49 R **20 Claims**



1. An apparatus for inductively heating cooking utensils comprising:

power supply means for providing a DC output pulsating at regular intervals between a zero point and a maximum point;

oscillator means electrically connected to said DC output for providing an AC sinusoidal output which is fully amplitude modulated by said DC output, said sinusoidal output being in the form of power pulses defined by a pulse train of generally identical modulation envelopes;

AC switching means electrically connected to said AC sinusoidal output and operable to switch between an electrically nonconducting condition and an electrically conducting condition only when said DC output is approximately at said zero point; and

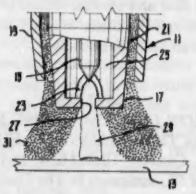
at least one induction heating coil electrically connected to said AC switching means, said coil producing an alternating magnetic field only when said AC switching means is in said conducting condition, said induction heating coil being power regulated by supplying a selective number of said power pulses to said induction heating coil via said AC switching means.

4,112,288

ORIFICE TIP

William R. Pieren, and Robert F. Stetson, both of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Apr. 17, 1975, Ser. No. 569,068
Int. Cl.² B23K 9/00
U.S. Cl. 219—121 P **3 Claims**



1. In a plasma arc torch having an orifice tip, the improvement in said tip comprising a substantially cylindrical rod-like member having an interior axial passage, an integral portion of

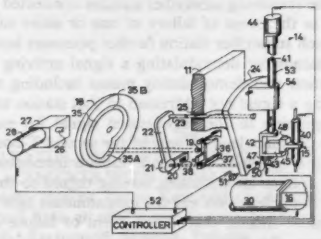
said cylindrical member forming an electrode for development of said arc and also forming a passage for communication of plasma developed by said arc away from said welding and cutting torch, said member being formed from an isotropic graphite of substantially uniform thermal conductivity in the longitudinal and transverse directions of the axial passage and having an average particle grain size of less than about 0.003 inches and an average pore size of less than about 1 micron and providing a good machinable graphite for forming said passage, the isotropic graphite forming said cylindrical member having selected qualities of a coefficient of thermal expansion in the range of about 4.6×10^{-6} to about 5×10^{-6} per degree Fahrenheit and a good electrical resistivity in the range of about 0.7×10^{-3} ohm inches to 1×10^{-3} ohm inches at 70° F.

4,112,289

WELDING APPARATUS

Kenneth W. Mead, and K. Stewart Peters, both of El Cajon, Calif., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Mar. 15, 1977, Ser. No. 777,847
Int. Cl.² B23K *9/00*
U.S. Cl. 219—124.33 **12 Claims**



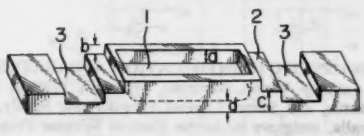
1. Welding apparatus for polygonal or non-circular workpieces, comprising a welding torch assembly, means for rotating a workpiece about an axis thereof with said axis in predetermined relation to said welding torch assembly so that successive points along a predetermined path of a weld to be made along the periphery of said workpiece are rotated past said welding torch assembly and define an arc gap extending between each of said points in succession and said welding torch assembly, means responsive to changes in the distance across said arc gap from a predetermined value for moving said welding torch assembly toward or away from said workpiece to restore said predetermined value, said weld path having at least one elongated portion thereof having a substantially different radius of curvature than an adjacent portion thereof, means for adjusting the instantaneous attitude of said welding torch assembly to said path so as to maintain the same substantially perpendicular to the surface of said workpiece in the plane of said path at each of said successive points, said last mentioned means including cam means conformed for synchronization with at least a part of said weld path and a cam follower responsive thereto and linked to said welding torch assembly, and means for actuating said cam means and cam follower in predetermined synchronized relation to the rotation of said workpiece.

4,112,290

EVAPORATION VESSEL FOR USE IN VACUUM EVAPORATION

Yukihiko Nakajima, Machida; Shuzou Watanabe, Kawasaki; Akira Miyai, Machida, and Masaji Ishii, Tokyo, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1976, Ser. No. 736,169
Int. Cl.² C23C *13/12*
U.S. Cl. 219—275 **8 Claims**



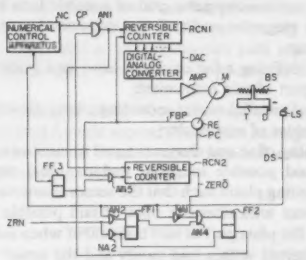
1. In an evaporation vessel solidly made of electroconductive ceramic for vacuum evaporation of a metallic or non-metallic substance by virtue of resistance heating generated by directly passing electric current through said evaporation vessel, the improvement wherein the surface of the adjoining portion on the both sides of a cavity through which electricity passes is lower than the top of the outside wall of said cavity for increasing the temperature in said adjoining portions due to a smaller cross-sectional area having an increased electrical resistance.

4,112,291

POSITIONING SYSTEM IN A NUMERICALLY CONTROLLED APPARATUS

Hiroomi Fukuyama, Higashiyamato, and Masahiro Kaku, Tachikawa, both of Japan, assignors to Fujitsu Fanuc Limited, Hino, Japan

Filed Mar. 22, 1977, Ser. No. 780,113
Claims priority, application Japan, Mar. 30, 1976, 51-34860
Int. Cl.² G06M *3/14*
U.S. Cl. 235—92 MP **6 Claims**



1. A positioning system in a numerically controlled apparatus in which positioning of a controlled object is performed by command pulses delivered from a numerical control apparatus, said positioning system comprising:

detecting means for generating first pulses each of which is indicative of a first predetermined amount of displacement of said object, for generating second pulses each of which is indicative of a second predetermined amount of displacement of said object larger than said first predetermined amount, and;

counting means which has a capacity which is equivalent to the number of the first pulses generated while the object moves said second predetermined amount, said counting means being adapted to count up said command pulses and said counting means being adapted to count down said first pulses until the first one of said second pulses are generated;

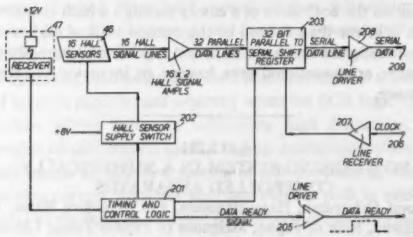
means for stopping said command pulses when the content of said counting means reaches a predetermined value.

4,112,292

MAGNETIC IDENTIFICATION APPARATUS

David Anthony Varvel, Mosman; Frederick William Millar, Frankston, and Stuart Connall Farquharson, Manly, all of Australia, assignors to Access Control Systems Proprietary Limited, Victoria, Australia

Filed Feb. 17, 1977, Ser. No. 769,532
Claims priority, application Australia, Aug. 17, 1976, 7034/76
Int. Cl.² G06K *7/08*
U.S. Cl. 235—449 **5 Claims**



1. Magnetic identification apparatus comprising a magnetically coded instrument and a reader to which to apply the instrument, said instrument having a flat plate part including a plurality of discrete magnetized portions disposed at certain locations on a rectangular grid of possible locations to determine the magnetic code of the instrument, and said reader comprising:

a body defining a flat cavity to serve as a guideway for said flat part of said instrument;

a pair of parallel sensor mounting plates disposed on opposite sides of said cavity;

a plurality of sensor elements equal in number to the number of said possible locations and mounted on said sensor mounting plates such that the sensor elements on one plate register with alternate ones of said possible locations on said flat plate part of said instrument when said instrument is inserted within said cavity and the sensor elements on the other plate register with the remainder of said possible locations, said sensor elements each being comprised of a Hall Effect device including a semi-conductor layer, a pair of control current electrodes through which to pass a control current through said semi-conductor layer in one direction and a pair of sensor electrodes through which to sense a potential difference between locations on the semiconductor layer which are spaced apart in a direction which is transverse to said one direction, said Hall Effect devices being oriented such that potential differences are generated by the presence of the magnetic fields of said magnetized portions of the instrument;

electrical input means to supply control current to the electrodes of the Hall Effect devices; and

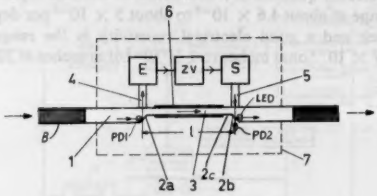
electric output means, conditioned by the generation of potential differences between the sensing electrodes of the Hall Effect devices, to provide an electrical output from the reader.

4,112,293

OPTICAL FIBER DATA TRANSMISSION SYSTEM

Alfred Käch, Untersiggenthal, Switzerland, assignor to Patelhold Patentverwertungs & Elektro-Holding AG, Glarus, Switzerland

Filed Mar. 15, 1977, Ser. No. 777,768
Claims priority, application Switzerland, Mar. 18, 1976, 3399/76
Int. Cl.² H04B *9/00*
U.S. Cl. 250—199 **11 Claims**



1. An optical fiber data transmission system in which the individual subscriber stations are connected by means of T-couplers arranged at discrete positions along a main lead and the coupling out and in of the light is effected directionally, so that two T-couplers are necessary for the connection of one subscriber's station, which effect directional coupling and collectively form a unit termed a TT-coupler, the incoming light being divided into two components in the first T-divider of the TT-coupler, of which one of said components passes to the receiver of the subscriber station and the second of said components passes directly through the TT-coupler, and wherein for the purpose of ensuring continued data transfer between the remaining subscriber stations connected along the main lead in the event of failure of one or more subscriber's stations, each subscriber station further possesses intermediate amplifier means for demodulating a signal arriving at a subscriber station said demodulating means including means for regenerating a signal not addressed to that station transmitter means responsive to the regenerated signal for passing the signal into the main lead by way of the second T-coupler, and wherein the attenuation of the individual transmission sections of the TT-coupler is so chosen, having regard to the limiting sensitivity of the receivers and the instantaneous light output of the transmitter means, that in the event of failure of one or more stations, the drop in signal level thus resulting can be compensated for by the next following operative station so as to be returned to a signal level within the normal operating range.

4,112,294

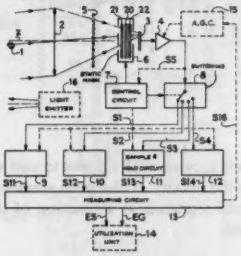
RADIANT ENERGY DETECTION SYSTEM FOR THE ANGULAR LOCATION OF A LIGHT-RADIATING OBJECT

Robert Pressiat, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 22, 1977, Ser. No. 808,836
Claims priority, application France, Jun. 25, 1976, 76 19422
Int. Cl.² G01J *1/20*
U.S. Cl. 250—203 R **9 Claims**

1. A radiant energy detection system for determining the angular location of a light radiating object, comprising, in combination: an opto-electrical receiver including, successively, an optical arrangement for focussing the radiation from the said object, a mask device of a static type controlled by an associated electrical control circuit, a photosensitive detector element centered on the optical axis and circuits for processing the detected signal to provide signals representing the divergence in bearing and elevation for the object being aimed at; the said static mask being controlled to present a configuration having a transparent area corresponding to *n* measurement

quadrants (n being a whole number at least equal to 1 and at most equal to 3) and an opaque area formed by the remaining 4-n measurement quadrants, said control providing four successive operating states which are distinguished from one another by an angular displacement of $\pi/2$ radians of the said configuration around the optical axis, and the said processing circuits including a switching circuit operated synchronously



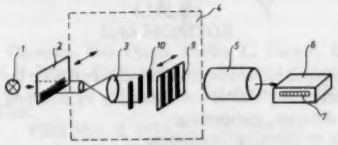
with the said static mask by the said control circuit to connect successively the output of the detector element to four reception channels each including a memory circuit for storing the detected signal value of a corresponding operating state, said reception channels serving to supply inputs to a divergence measuring circuit for measuring the said divergences from four detected signal values.

4,112,295

APPARATUS FOR DIRECT MEASUREMENT OF DISPLACEMENTS WITH A HOLOGRAPHIC SCALE

Adam Dubik; Henryk Zenon Kowalski; Pawel Osiennik, and Franciszek Król, all of Warsaw, Poland, assignors to Instytut Geodezji i Kartografii, Warsaw, Poland

Continuation of Ser. No. 643,618, Dec. 22, 1975, abandoned.
This application Aug. 9, 1977, Ser. No. 824,209
Claims priority, application Poland, Dec. 30, 1974, 176959
Int. Cl.[2] H01J 3/14
U.S. Cl. 250—237 G **4 Claims**



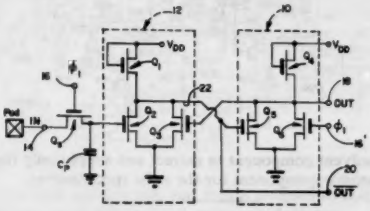
1. Apparatus for direct digital measurement of linear and angular displacement, comprising: a holographic scale of a density from several hundred to several thousand lines per millimeter, an optical system discriminating against zero order diffraction line order from said scale, a striated diaphragm comprising a magnified pattern of zero order diffraction lines orders of said scale, and a detector transforming light pulses generated due to mutual displacement of the scale and diaphragm into corresponding electrical pulses, said holographic scale being located so as to fill completely the transmission field of the optical system.

4,112,296

DATA LATCH

Gary L. Heimbigner, Anaheim, and Robert K. Booher, El Toro, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 7, 1977, Ser. No. 804,220
Int. Cl.[2] H03K 3/286, 3/353, 5/18, 17/28
U.S. Cl. 307—279 **10 Claims**



1. In combination:
input signal source means,
a first NOR gate,
a second NOR gate,
each of said first and second NOR gates including a respective pair of interconnected multi-terminal transistor devices,
clock terminal means to provide a clock enabling signal, and transmisiion gate means,
said tranmission gate means having a conduction path connected between said input signal source means and said first NOR gate and a control electrode connected to said clock terminal means to receive said clock enabling signal,
a first transistor device from the pair of transistor devices included by said first NOR gate having control and conduction path terminals respectively cross-connected to conduction path and control terminals of a first transistor device from the pair of transistor devices included by said second NOR gate,
the second transistor device from the pair of transistor devices included by said first NOR gate having a control terminal connected to the conduction path at said transmission gate means to receive an input signal therefrom, and
the second transistor device from the pair of transistor devices included by said second NOR gate having a control terminal connected to said clock terminal means to receive said clock enabling signal.

4,112,297

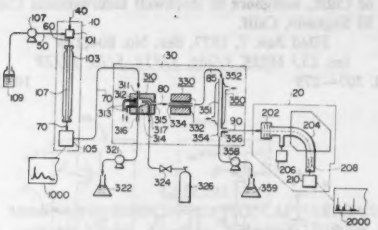
INTERFACE FOR USE IN A COMBINED LIQUID CHROMATOGRAPHY - MASS SPECTROMETRY SYSTEM

Hiroyuki Miyagi; Fumito Nakajima, and Yoshijiro Arikawa, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 30, 1977, Ser. No. 811,720
Claims priority, application Japan, Jun. 30, 1976, 51-76362
Int. Cl.[2] B01D 59/44
U.S. Cl. 250—288 **7 Claims**

1. An interface for use in a combined liquid chromatography — mass spectrometry system which extracts a sample component out of the effluent including the sample component and a solvent component from a liquid chromatograph and supplies the extracted sample component for a mass spectrometer, characterized in that the interface comprises first means for nebulizing the effluent from the liquid chromatograph and heating it in a manner that only the solvent component is

evaporated, and second means for separating said nebulized effluent into the nebulized sample component and the evaporated solvent component to extract and supply only the nebulized sample component for the mass spectrometer.

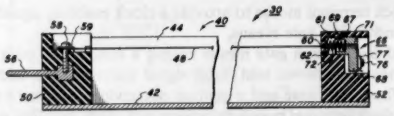


4,112,298

CORONA WIRE MOUNTING MEANS

Donald J. Weikel, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1977, Ser. No. 783,359
Int. Cl.[2] H01T *19/04*
U.S. Cl. 250—324 **5 Claims**



1. A corona device comprising
an elongated coronode supported between first and second fixed support members,
means for fixing one end of said coronode to said first support member,
a coil spring coaxially carried adjacent the other end of the electrode,
an interference member outboard of said spring and attachable to said coronode adjacent said other end thereof,
said second member defining a bearing surface against which one end of said spring rests,
said second member further comprising first and second bores in communication with each other through which said coronode passes, said bearing surface located intermediate said bores, said second bore housing said spring and having a diameter larger than said first bore, said interference member being reciprocally movable within said second bore,
whereby said coronode is placed under tension by fixing said one end of said coronode to said first support member in a position to draw said interference member into loading contact with said spring and place it under tension between said surface and said interference member.

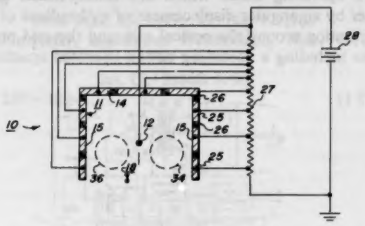
4,112,299

CORONA DEVICE WITH SEGMENTED SHIELD

Thomas G. Davis, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 710,525, Aug. 2, 1976, abandoned, which is a continuation of Ser. No. 553,339, Feb. 26, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,782
Int. Cl.[2] G03G *15/00, 15/02*
U.S. Cl. 250—326 **6 Claims**

1. A corona device for charging a surface comprising an elongated wire,
means for applying a corona generating potential to said wire, and
a shield disposed on the side of said wire opposite said surface, said shield being formed of a plurality of conductive segments insulated from each other and biased to different potentials with respect to said wire, each of said conductive segments located with respect to said wire to substantially effect the density of charge in areas intermediate said wire and said segments as a function of the potential on said segment.

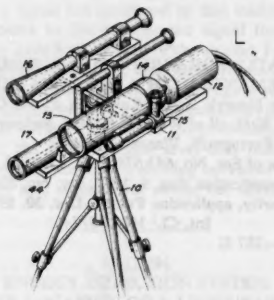


4,112,300

INFRARED ELECTRONIC COUNTERMEASURES

Freeman F. Hall, Jr., and Jerome J. Redmann, both of Los Angeles, Calif., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jul. 18, 1966, Ser. No. 567,346
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—330 **7 Claims**

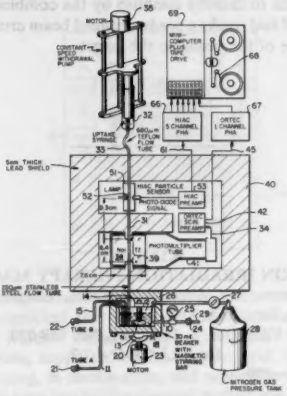


1. An infrared electronic countermeasure device for interfering with an enemy's detection capability by jamming or damaging his detector, comprising:
a source of jamming irradiation;
means for detecting a target; and
means coupled to said detecting means for aiming said source of jamming irradiation at said detected target,
said target detecting means including a proximity focused image converter tube, an objective lens system, an erector lens, crosshairs and an ocular whereby said objective lens system forms an inverted image of a target at the photocathode of said proximity focused image converter tube, which image is transferred to the phosphor screen thereof, furthermore said image is transferred to the plane of said crosshairs by said erector lens and orientated to its true orientation for viewing through said ocular.

4,112,301
MOVING PARTICLES SUSPENDED IN A CARRIER FLUID THROUGH A FLOW CHANNEL HAVING AN INPUT END UNDER GAS PRESSURE

Martin Annis, Newton; Paul Bjorkholm, Sharon; Carolus M. Cobb, Arlington; Edwin Frederick, Concord, and Alan Ramsey, Harvard all of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Filed Jun. 3, 1976, Ser. No. 692,322
Int. Cl.² G01T *1/20*
U.S. Cl. 250—364 **11 Claims**



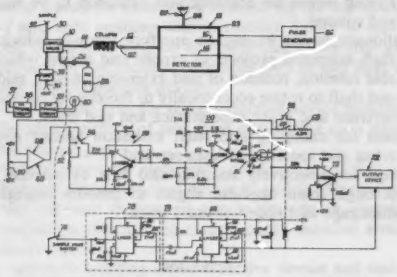
1. A method of moving particles suspended in a carrier fluid through a flow channel which method includes the steps of,
introducing the suspension of the particles in the carrier fluid into said flow channel,
applying gas pressure at the input end of said flow channel,
establishing a proper variable pressure at said output end to establish substantially constant average velocity of said suspension through said flow channel,
applying mechanical pressure at the output end of said flow channel so that the rate of flow of said suspension through said flow channel is determined by the mechanical pressure at said output end by withdrawing a plunger connected to the output end of said flow channel at constant velocity,
and applying gas under pressure into a sealed chamber embracing a liquid container,
the said liquid container embracing the input end of said flow channel.

4,112,302
GAS MONITOR

Brian S. Flanagan, San Diego; Phillip L. Turner, Del Mar; Richard D. Broce, Vista, and Peter L. Lagus, Olivenhain, all of Calif., assignors to Systems, Science and Software, La Jolla, Calif.

Filed Mar. 2, 1977, Ser. No. 773,605
Int. Cl.² G01T *1/18*
U.S. Cl. 250—381 **9 Claims**

1. A gas monitor comprising means for detecting changes in electron flow between two electrodes caused by absorption of the electrons by an electron capture gas flowing between said electrodes, means for supplying a carrier gas to said detecting means at a predetermined velocity, valve means for adding a sample of gas to said carrier gas at a first predetermined time, said sample gas containing a trace of a first type of electron capture gas, column means connected between said adding means and said detecting means for selectively slowing down the velocity of any other type of electron capture gas in said sample with respect to the velocity of the first type of electron capture gas, means coupled to said detector for measuring the maximum decrease in the electron flow caused by said first

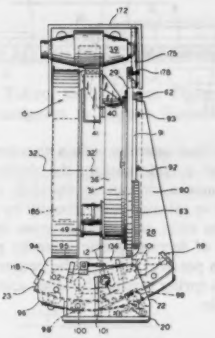


type of electron capture gas, and means coupled to said measuring means for indicating said maximum decrease.

4,112,303
GANTRY FOR COMPUTED TOMOGRAPHY

Richard Thornton Brandt, New Berlin, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1977, Ser. No. 771,864
Int. Cl.² A61B *6/02*; G01N *23/08*
U.S. Cl. 250—445 T **2 Claims**



1. X-ray tomographic apparatus comprising:
frame means supported for movement along a curved path about a laterally directed virtual axis to thereby enable said frame means to be tilted between opposite angles with respect to vertical,
curved track means disposed downwardly convexly and mounted, respectively, to opposite sides of said frame means for supporting said frame means, the radii of curvature of said track means passing through said virtual laterally directed axis,
stationary support means spaced from each other in the lateral direction at opposite sides of said frame means adjacent said tracks, respectively,
roller means supported for rotation respectively on said stationary support means, one of said track means bearing on one of said roller means and another of said track means bearing on another of said roller means, and
brake means operable to hold said frame means at a selected angle of tilt, said brake means comprising:
a brake shoe body having a surface for being disposed in proximity with said track and for being moved into frictional engagement with said track,
a first cylindrical shaft journaled for rotation in said body,
a second cylindrical shaft journaled for rotation in said first shaft with the axis of the second shaft in parallel with the axis of said first shaft,

an extension shaft projecting axially from said second shaft and the axis of said extension shaft being eccentric with respect to the axis of said second shaft, said extension having means for enabling said extension to be engaged and rotated,

stationary means having an aperture through which said shaft extension projects to expose said means which enable rotation, rotation of said extension causing said second shaft to rotate eccentrically to thereby set the spacing between said brake shoe surface and said track,

means for clamping said shaft extension against rotation when said spacing has been set, and

means for selectively rotating said first cylindrical shaft through small opposite angles to thereby engage and disengage said shoe with said track.

4,112,304

X-RAY CASSETTE WITH A WINDOW FOR ILLUMINATING PATIENT DATA

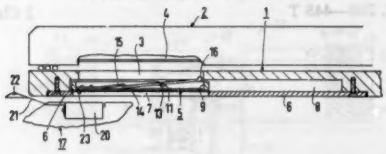
Robert Huettner, Heroldsbach, Thurn, and Gerhard Kuetterer, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 29, 1977, Ser. No. 782,523

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646725

Int. Cl.² G03C *5/16*

U.S. Cl. 250—476 **9 Claims**



1. An x-ray film cassette with a window for illuminating patient data and a slide sealing the window tightly against light, a spring means for locking the slide in a closed position and which can be released magnetically by positioning a magnet adjacent the slide, said spring means including a see-saw like lever arm of ferromagnetic material pivotably mounted about a tilt axis passing through the center of gravity of said lever arm and a spring biasing the lever arm into a position for locking the slide.

4,112,305

METHOD OF PROJECTING A BEAM OF CHARGED PARTICLES

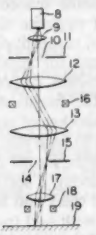
Eiichi Goto, Fujisawa; Takashi Soma, Kiyose, and Masanori Idesawa, Wako, all of Japan, assignors to Rikagaku Kenkyusho, Japan

Filed Oct. 15, 1976, Ser. No. 732,919

Claims priority, application Japan, Oct. 23, 1975, 50-127833

Int. Cl.² A61K *27/02*

U.S. Cl. 250—492 R **9 Claims**



1. A method of projecting a beam of charged particles to a target through two apertured masks which comprises focusing a beam of charged particles on the first of said masks, passing said beam through the aperture of said first mask to establish a beam cross-section corresponding to the contour of said first mask aperture, deflecting said beam, after passing through the first of said masks and before passing through the second of said masks, in a transverse direction and by a given distance with respect to said second aperture, focusing the deflected beam on the second of said masks, passing only a portion of said beam through the aperture of said second mask to modify the cross-section of said beam in accordance with the contour of said second mask aperture and the direction and distance of said deflection to thereby establish by the combined interception action of said masks a predetermined beam cross-section at the incidence of the beam on the target.

4,112,306

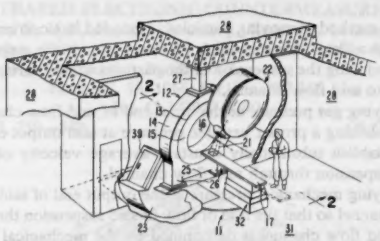
NEUTRON IRRADIATION THERAPY MACHINE

Craig S. Nunan, Los Altos Hills, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 6, 1976, Ser. No. 748,020

Int. Cl.² G21G *4/02*

U.S. Cl. 250—499 **26 Claims**



1. In a neutron irradiation therapy machine for treating patients with a beam of neutrons:

cyclotron means for accelerating protons to a high energy and for bombarding a target to generate a beam of high energy neutrons to be applied to the patient, said cyclotron means having magnet means for generating a magnetic field for interaction with the protons, said magnet means including a pair of pole portions spaced apart to define a magnetic gap therebetween and within which the magnetic field of said magnet means produces a force on said protons, said magnet means having a yoke means of ferromagnetic material interconnecting said pair of pole portions for providing a relatively low reluctance magnetic flux path for returning the magnetic flux to the respective pole portions, magnetomotive force generating mean coupled in magnetic flux exchanging relation with said pole portions for generating a magnetomotive force and for exciting said magnetic pole portions to opposite magnetic polarities,

proton source means for supplying protons to the region between said pole portions to be accelerated to an energy in excess of 15 MeV, and

gantry means for pivoting said cyclotron about a patient treatment region,

neutron filter means disposed in the neutron beam between the target and the patient treatment region for attenuating relatively low energy neutrons of the beam.

4,112,307

ELECTRON BEAM SOURCE WITH AN ELECTRON EXIT WINDOW CONNECTED VIA A WINDOW FLANGE

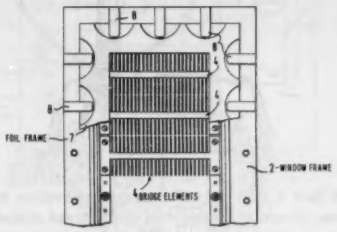
Eberhard Föll, Mössingen, and Helmut Vetter, Tübingen, both of Fed. Rep. of Germany, assignors to Polymer-Physik GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 9, 1977, Ser. No. 767,027

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1976, 2606169

Int. Cl.² G21F *3/02*

U.S. Cl. 250—510 **3 Claims**



1. In an electron beam source with an electron exit window which is connected thereto, with the window comprising essentially a window frame, a support grid, and a foil, permeable to electrons, supported by the support grid, the improvement comprising, in combination, said support grid being constituted by at least one bridge element in the form of a substantially rectangular metal plate having a plurality of milled slots extending inwardly from each of a pair of opposite edges thereof and terminating at a main bridge extending substantially centrally of said plate substantially parallel to said opposite edges, whereby each bridge element has the form of a one-piece double comb formed solely by a mechanical machining of a one-piece metal plate; and disengageable mechanical fastening elements securing each bridge element to said window frame and constituting the sole means disengageably connecting each bridge element to said window frame.

4,112,308

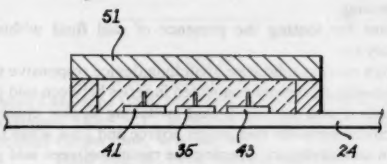
OPTICAL COUPLING SYSTEM

Wilfred W. Olschewski, and Robert M. Stitt, both of Tucson, Ariz., assignors to Burr-Brown Research Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 671,324, Mar. 29, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 830,586

Int. Cl.² G02B *27/00*

U.S. Cl. 250—551 **7 Claims**



1. An optical coupling system for use in an electrical circuit for electrically isolating one portion of said electrical circuit from another portion of said electrical circuit, said optical coupling system comprising in combination:

(a) an electrically insulating and optically opaque substrate;

(b) a plurality of co-planar electrically conductive strips positioned on said substrate, including first and second conductive strips separated by a first non-conductive gap, and third and fourth conductive strips separated by a second non-conductive gap;

(c) a light emitting semiconductive device mounted on the upper surface of said first conductive strip adjacent the first gap;

(d) first means for electrically connecting the top electrode of said light emitting semiconductive device to said second conductive strip on the other side of the first gap to provide an electrically continuous path to said light emitting semiconductive device;

(e) a first photo detector semiconductive device mounted on the upper surface of said third conductive strip adjacent the second gap;

(f) second means for electrically connecting said first photo detector semiconductive device to said fourth conductive strip adjacent the second gap to provide an electrically continuous path to said second photo detector semiconductive device;

(g) said light emitting semiconductive device and said first photo detector semiconductive device being mounted in substantially co-planar relationship with respect to each other; and

(h) an open bottom housing mounted on said substrate over said semiconductive devices to enclose said semiconductive devices, said open bottom housing having light reflecting interior surfaces, said first, second, third and fourth conductive strips extending outwardly from the bottom of said open bottom housing;

whereby, light emitted by said light emitting semiconductive device is reflected throughout said open-bottom housing and impinges upon said photo detector semiconductive device.

4,112,309

APPARATUS FOR MEASURING THE LINE WIDTH OF A PATTERN

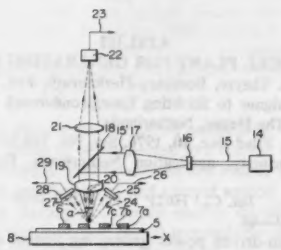
Kiwao Nakazawa, Tokyo, and Akikazu Tanimoto, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 10, 1976, Ser. No. 740,495

Claims priority, application Japan, Nov. 22, 1975, 50-139740

Int. Cl.² G01N *21/30*

U.S. Cl. 250—560 **3 Claims**



1. An apparatus for photoelectrically detecting the position of each of the edges of a line having the opposite edges thereof formed substantially parallel to each other on a substrate, to thereby measure the width of the line, comprising:

a light source emitting coherent light;

means for condensing the coherent light into a tiny light spot smaller than the width of the line and illuminating said line with said light spot;

means for imparting to said tiny light spot a minute oscillation having an amplitude less than the width of said line;

means for moving said tiny light spot and said line relative to each other so that diffracted light may be created at each of the edges of said line;

first photoelectric converter means for receiving chiefly the diffracted light created at one of the edges of said line and producing an output signal modulated by said oscillation;

second photoelectric converter means for receiving chiefly the diffracted light created at the other edge of said line

and producing an output signal modulated by said oscillation; and

a circuit for producing position signals corresponding to the edges of said line in response to the modulated output signals from said first and second photoelectric converter means.

4,112,310

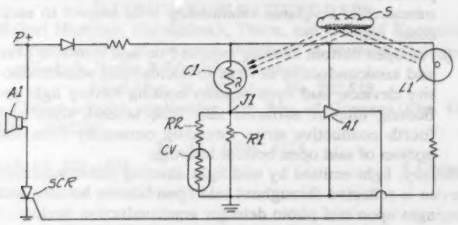
SMOKE DETECTOR WITH PHOTO-RESPONSIVE MEANS FOR INCREASING THE SENSITIVITY DURING DARKNESS

William J. Malinowski, Pembroke, Mass., assignor to Chloride, Incorporated, Tampa, Fla.

Filed May 19, 1977, Ser. No. 798,582

Int. Cl.[2] G01N *21/26*

U.S. Cl. 250—574 **9 Claims**



1. A particle detector, in which means is provided responsive to the presence of particles to produce an output signal, said detector having two modes of operation and being responsive in a first mode to a predetermined concentration of particles to produce an alarm signal, and being responsive in a second mode to produce an alarm signal at a particle concentration substantially less than said predetermined concentration, in which the detector shifts automatically from one mode to another with a substantial change in the ambient light level.

4,112,311

WINDMILL PLANT FOR GENERATING ENERGY

Frederik H. Theyse, Bensberg-Herkenrath, Fed. Rep. of Germany, assignor to Stichting Energieonderzoek Centrum Nederland, The Hague, Netherlands

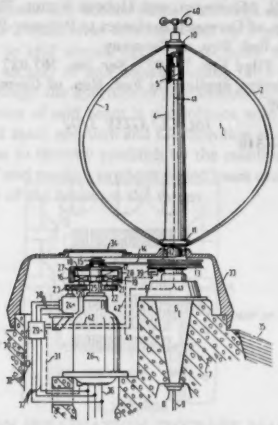
Filed Dec. 10, 1976, Ser. No. 749,267

Claims priority, application Netherlands, Dec. 18, 1975, 7514750

Int. Cl.[2] H02P *9/04*; F03D *9/00*

U.S. Cl. 290—44 **10 Claims**

1. A Wind-driven power generating system comprising: a wind-driven impeller having blades; a variable ratio transmission having a main rotary output, a main rotary input and a rotary connection capable of operating either as an input or an output, the rotation of the main output being a function of the rotations of the main input and the rotary connection; means drivingly connecting the impeller to the main transmission input; a main energy convertor drivingly connected to the main transmission output for converting rotation of the latter to another form of energy; means for selectively increasing the decreasing the rotational speed of said main transmission output, said means including a reversible variable speed auxiliary energy-convertor operatively connected to said main convertor and to the rotary connection of the transmission, said auxiliary convertor being operable in a first mode to withdraw energy from the power flow through said main convertor and converting the withdrawn energy to rotation of said rotary connection in an input direction and in a second mode to withdraw energy from said rotary connection when rotating in an output direction and add the withdrawn energy to the power flow through said main convertor; and control means responsive to at least one variable of the system for controlling



said auxiliary convertor to operate in a selective one of said modes.

4,112,312

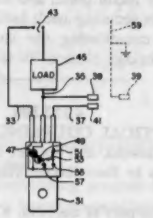
FLUID SENSITIVE SWITCHING MEMBER

James D. McGalliard, 11171 Fenwick Pl., Santa Ana, Calif. 92705

Filed Mar. 14, 1977, Ser. No. 777,183

Int. Cl.[2] H01H *35/18*

U.S. Cl. 307—118 **10 Claims**



1. A device for electrically connecting a power source to a load in response to the presence of a fluid within a cavity, comprising:

means for sensing the presence of said fluid within said cavity;

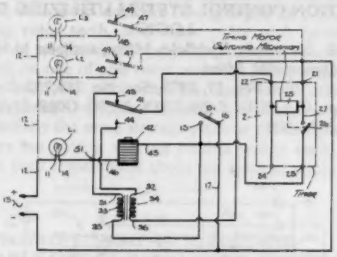
a high current solid state switching device responsive to said sensing means and connected in series between said power source and said load, said switching device closing the circuit between said power source and load when fluid is in said cavity and opening the circuit between said power source and load when fluid is absent from said cavity, said switching device producing heat sufficient to degrade said switching device when said switching device closes said circuit unless said switching device is cooled, said switching device not producing such self-degrading heat when said switching device opens said circuit; and

means for conducting heat from said high current switching means to said fluid within said cavity to cool said switching device when said heat conducting means is in direct contact with said fluid in said cavity, said conducting means being incapable of cooling said high current switching means when fluid is absent from said cavity.

4,112,313
TIMER CONTROL ARRANGEMENT FOR USE WITH A WALL SWITCH

Lawrence H. Kutin, 2 Warren Pl., Plainview, N.Y. 11803

Filed Jun. 8, 1977, Ser. No. 804,861
Int. Cl.[2] H01H *43/00*
U.S. Cl. 307—141 8 Claims



1. A timer control arrangement for use with a wall switch, said wall switch having first and second contacts, said first contact being connected to one terminal of an ac voltage source and said wall switch being adapted to connect a first terminal of a light source to said one terminal of said voltage source, the light source having a second terminal connected to the other terminal of said voltage source, said arrangement comprising:

a timer assembly adapted to connect for a predetermined period of time said first terminal of said light source to said one terminal of said voltage source, said timer assembly including: first, second and third terminals, said second and third terminals being adapted to be connected to the respective first and second contacts of said wall switch; a current path connected between said second and third terminals, said current path including a switch for opening and closing said current path; and a timing motor switching means connected between said first and second terminals for controlling said switch to close said current path during said predetermined period of time;

a transformer having a primary and secondary winding, said primary winding having a first end adapted to be connected to said first terminal of said light source and a second end connected to said third terminal of said timer assembly, said secondary winding having a first end connected to said second terminal of said timer assembly;

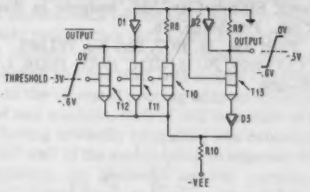
and switch means for selectively connecting said first end of said primary winding and a second end of said secondary winding to said first terminal of said terminal of said timer assembly.

4,112,314
LOGICAL CURRENT SWITCH

Venkappa Laxmappa Gani, and Frank Alfred Montegari, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 26, 1977, Ser. No. 827,929
Int. Cl.[2] H03K *19/08, 19/12, 19/30, 19/34*
U.S. Cl. 307—215 6 Claims

1. In a logical current switch adapted to receive a plurality of logical inputs each having a predetermined voltage swing and providing a first in phase logical output and a second out of phase logical output, said first and second outputs each having said predetermined voltage swing and being respectively a predetermined logical function of said plurality of inputs, said logical current switch being characterized by including only a single power supply coupled across the collector emitter current paths of at least one first bipolar transistor, which is responsive to a logical input voltage swing, and a second bipolar transistor, and further including a Schottky

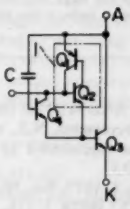


barrier diode connected between the emitters of said first and second bipolar transistors.

4,112,315
SEMICONDUCTOR SWITCH CIRCUIT

Ichiro Ohhinata, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Sep. 7, 1976, Ser. No. 720,759
Claims priority, application Japan, Sep. 8, 1975, 50-108714; Sep. 8, 1975, 50-108715; Sep. 10, 1975, 50-108969
Int. Cl.[2] H03K *17/72, 17/60*
U.S. Cl. 307—254 8 Claims



1. A semiconductor switch circuit comprising:

an input terminal to be connected to a current source;

an output terminal to be connected to a load to which a load current is supplied from said current source;

a transistor having a collector-emitter circuit connected between said input and output terminals for allowing said load current to flow therethrough;

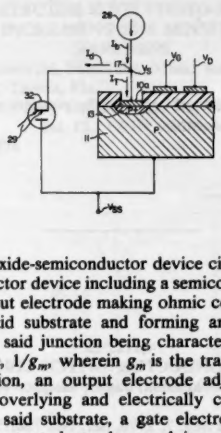
a PNPN semiconductor switch of an equivalently four-layered PNPN structure including three PN-junctions, two main electrodes and at least a gate electrode and adapted to be rendered conductive for allowing current flow between said two main electrodes or nonconductive for preventing such current flow by adjusting a gate current applied to said gate electrode; and

a variable impedance bypass circuit, said variable impedance bypass circuit being connected to shunt one of said three PN-junctions at either one end of said PNPN switch, said main electrodes being connected through a base-emitter circuit of said transistor between said input and output terminals for allowing a part of said load current to flow therebetween through said base-emitter circuit when said PNPN switch is rendered conductive and for rendering said transistor nonconductive when said PNPN switch is rendered nonconductive.

4,112,316
CHARGE COUPLED DEVICE CIRCUIT WITH INCREASED SIGNAL BANDWIDTH

John L. Wentz, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1977, Ser. No. 792,089
Int. Cl.[2] H01L 29/78; G11C 19/00; H03K 3/42
U.S. Cl. 307—304 6 Claims

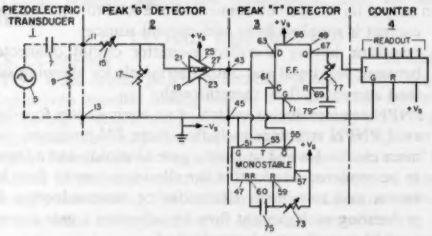


1. A metal-oxide-semiconductor device circuit comprising:
a semiconductor device including a semiconductor substrate and an input electrode making ohmic contact with a surface of said substrate and forming an ohmic junction therewith, said junction being characterized by an input impedance, $1/g_m$, wherein g_m is the transconductance of said junction, an output electrode adjacent said input electrode overlying and electrically connected to said surface of said substrate, a gate electrode between said input and output electrodes overlying and insulated from said surface of said substrate;
means for generating an electrical signal;
means for connecting said electrical signal to said input electrode; and
current source means for applying an additional current to said input electrode to reduce the input impedance of said ohmic junction.

4,112,317
PULSE AMPLITUDE AND WIDTH DETECTION SYSTEM

David N. Everswick, Succasunna, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 5, 1977, Ser. No. 793,820
Int. Cl.[2] H03K 5/153, 5/18
U.S. Cl. 307—308 6 Claims

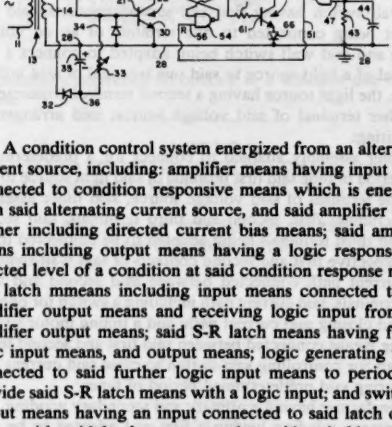


1. A detection system comprising:
a piezoelectric transducer means for measuring shock and generating output pulses in response thereto,
CMOS circuit means, connected to said transducer means, for detecting each pulse having an amplitude at least equal to a predetermined amplitude
said CMOS circuit means being adapted to produce an output signal in response to an analog input potential at least equal to a predetermined fraction of a reference potential applied thereto;
means, connected to the output of said pulse amplitude detecting means, for detecting each pulse having a time width at least equal to a predetermined width at said predetermined amplitude; and
means, connected to the output of said pulse width detecting means, for recording said detected pulses.

4,112,318
CONDITION CONTROL SYSTEM UTILIZING DIGITAL LOGIC

William B. Hamelink, Richfield, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 17, 1977, Ser. No. 769,752
Int. Cl.[2] H03K 3/26; G01N 27/00; G08B 21/00
U.S. Cl. 307—308 15 Claims

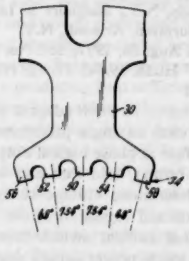


1. A condition control system energized from an alternating current source, including: amplifier means having input means connected to condition responsive means which is energized from said alternating current source, and said amplifier means further including directed current bias means; said amplifier means including output means having a logic response to a selected level of a condition at said condition response means; S-R latch mmeans including input means connected to said amplifier output means and receiving logic input from said amplifier output means; said S-R latch means having further logic input means, and output means; logic generating means connected to said further logic input means to periodically provide said S-R latch means with a logic input; and switching output means having an input connected to said latch output means with said latch means causing said switching output means to provide an output only when both of said S-R latch logic input means respond to the presence of logic indicating said selected level of said condition is present.

4,112,319
SYNCHRONOUS MOTOR WITH HETEROGENEOUSLY PITCHED TEETH

John H. Field, Norfolk, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.

Filed Dec. 23, 1976, Ser. No. 753,883
Int. Cl.[2] H02K 37/00
U.S. Cl. 310—49 R 24 Claims



1. An electric motor, comprising a stator having an axis, said

stator having a plurality of axially extending radially projecting stator poles, a rotor, said rotor having a pair of rotor members coaxial with said stator and positioned at two positions along the axis, said stator and said rotor being axially rotatable relative to each other, said rotor members being at least partially radially aligned with said stator poles, magnetic means magnetically coupled to said rotor members for causing one member to exhibit a magnetic polarity opposite to that of the other member, said rotor members having a plurality of radially projecting rotor teeth, said stator poles each having a plurality of pole teeth radially projecting toward said rotor teeth, the teeth on one of said rotor members being angularly displaced one-half tooth pitch from the teeth on the other of said rotor members, the teeth on each of said stator poles having substantially the same average pitch as the teeth of the rotor members but having varying pitches within each pole which pitches vary symmetrical about the average pitch.

4,112,320

ANISOTROPIC MAGNET STRUCTURE, PARTICULARLY SEGMENTAL MAGNET STRUCTURE FOR PERMANENT MAGNET DYNAMO ELECTRIC MACHINES

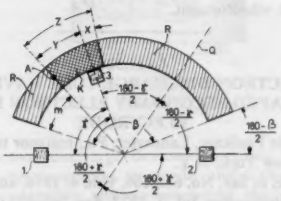
Adolph Mohr, Buhlertal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 6, 1977, Ser. No. 757,149

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1976, 2602650

Int. Cl.² H02K *21/26, 23/04*

U.S. Cl. 310—154 **5 Claims**



1. In combination with a three-brush motor, having two electrically diametrically located brushes and the third brush positioned unsymmetrically between said two brushes,

a magnet structure having

an elongated arcuate magnet element consisting of a ferrite selected from the group of at least one of: barium, strontium,

said magnet element having zones of ferrite material with different magnetic properties with respect to coercivity and remanence, wherein the ferrite material of high coercive force is located intermediate the arcuate extent of the magnetic element and unsymmetrically with respect to its length and positioned in the angular region of the third, unsymmetrically positioned brush,

and the end portions of the structure adjacent said material of high coercive force comprises ferrite material of high remanence.

4,112,321

BRUSH HOLDER AND BRUSH ASSEMBLY FOR A DYNAMOELECTRIC MACHINE

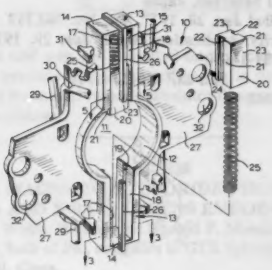
John P. Wan, Cambridge, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Jul. 26, 1977, Ser. No. 819,413

Int. Cl.² H02K *13/00*

U.S. Cl. 310—242 **9 Claims**

1. A brush holder and brush assembly for a dynamoelectric machine, said holder comprising a moulded, one-piece member of electrical insulating material having an opening therein adapted to receive a rotating part of the machine that is adapted to be contacted by electrical current carrying brushes, said member including at least two oppositely disposed brush holding housings, each of said housings having an end wall remote from the aforesaid opening and being open on two opposite sides thereof, each of said housings also having two spaced apart side walls facing each other and extending from said end wall thereof, each of said housings also having a second end opposite said end wall, said second end being open and opening into the aforesaid opening adapted to receive said rotating part of said machine, each of said side walls of each of said housings having inwardly projecting ribs extending from adjacent one end wall of the said housing to adjacent the other end of the housing, an electrical current carrying brush mounted in each of said housings, each said brush having side



walls with recesses therein into which said ribs extend, thereby providing tracks for guiding said brushes as they move longitudinally in said housings, said brushes bearing against said side walls of said housings, spring means located within said housings between said end walls thereof and said brushes and biasing said brushes into the opening in said member that is adapted to receive said rotating part of said machine, each of said housings also including a finger located adjacent one of said open sides of said housing and formed integral with said member, said finger and said ribs of each said housing contacting said spring in said housing and serving to prevent said spring from falling out of said housing through said open sides thereof.

4,112,322

PIEZOELECTRIC GAS IGNITER USING OPEN FRAME

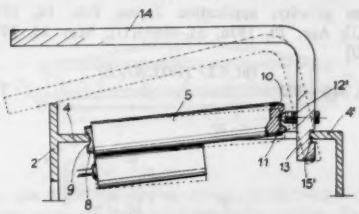
Luigi Venturi, Via N. Castellini 3, Brescia, Italy

Filed Dec. 20, 1976, Ser. No. 752,322

Claims priority, application Italy, Dec. 23, 1975, 5259 A/75; Apr. 7, 1976, 5145 A/76

Int. Cl.² H01L *41/10*

U.S. Cl. 310—339 **8 Claims**



1. A piezoelectric gas igniter comprising an outer body member; a frame support attached to said body member; a window opening on said support and having two sides opposed to each other; an elongated, angularly displaceable piezoelectric cartridge positioned within said opening and having a slit on a first end thereof for receiving one of said opposed sides of said window opening therein, said cartridge having a seat on said second end thereof opposite said first end, a control lever

that is angularly displaceable in a direction that is opposite said angular displacement of said cartridge, said control lever being coupled to said outer body member and having a first slit therein for receiving said other side of said opening therein; and an axially displaceable screw positioned with its tip engaged within said seat on the said second end of said cartridge, said screw being threaded through and movable together with said lever, said screw being adapted to compress said cartridge when said lever is angularly displaced.

4,112,323

CIRCULAR FLEXURAL MODE PIEZOELECTRIC VIBRATOR WITH INTEGRAL SUPPORT ARMS

Hirofumi Kawashima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 28, 1977, Ser. No. 763,712

Claims priority, application Japan, Jan. 29, 1976, 51-8633; Feb. 13, 1976, 51-14690

Int. Cl.² H01L *41/10*

U.S. Cl. 310—348 **6 Claims**

1. A piezoelectric flexural mode vibrator comprising a thin flat plate of piezoelectric crystal having a uniform thickness of 25 to 150 microns and having peripheral edges chemically etched to define a generally circular disc less than 10mm. across and a plurality of circumferentially spaced integral support portions projecting from the periphery of said disc and constituting the outermost portions of said plate, said support portions having outer edge surfaces for bonding to a support surface and a pair of electrodes applied directly to opposite faces of said disc, each of said electrodes comprising two electrically connected portions of which one portion is disposed on one face of said disc and the other portion is disposed on the opposite face of the disc, each portion of each of said electodes being disposed opposite a corresponding portions of the other electrode on the opposite face of the disc for excitation of said disc in the flexural mode of vibration.

4,112,324

MOUNTING FOR PLURAL PIEZOELECTRIC VIBRATOR UNITS

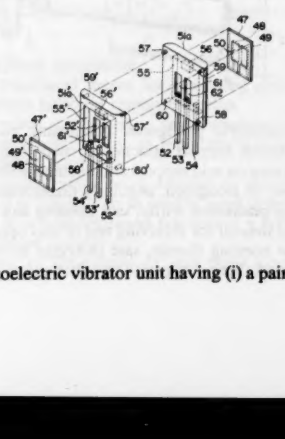
Kazumasa Yamaguchi; Kunio Nasaki, and Masanori Ohshiro, all of Komae, Japan, assignors to Kabushiki-Kaisha Kinsekisha-Kenkyujo, Tokyo, Japan

Filed Feb. 14, 1977, Ser. No. 768,525

Claims priority, application Japan, Feb. 14, 1976, 51-16574[U]; Apr. 20, 1976, 51-49695[U]; May 14, 1976, 51-61033[U]

Int. Cl.² H01L *41/10*

U.S. Cl. 310—353 **7 Claims**



1. In a piezoelectric vibrator unit having (i) a pair of vibrator assemblies each consisting of a holder case, a vibrator plate having excitation electrode means formed on the principal faces thereof, and lead wires for said excitation electrodes, and (ii) a metal plate for preventing mutual interference between the vibrator plates in said vibrator assemblies, the improvement which comprises, in combination:

(a) said holder case is of an electrically insulating material and has a front side provided with a recess for receiving therein said vibrator plate,

(b) said lead wires extend through and are secured in a side wall of said case bounding said recess and have tip portions located in alignment with one another within said recess so that said tip portions can serve for the spacing of said vibrator plate from a bottom wall of said case bounding said recess,

(c) said vibrator plate is fixed within said recess by said tip portions being bonded to said excitation electrode means,

(d) said bottom wall includes port means therethrough to permit the micro-adjustment of said excitation electrode means facing said bottom wall,

(e) said front side of one of said holder cases of said pair of vibrator assemblies faces in a direction opposite to the direction faced by said front side of the other of said holder cases of said pair of vibrator assemblies,

(f) said respective front sides of said holder cases are covered by said metal plate and are attached thereto at the respective sides of said metal plate, said pair of vibrator assemblies being coupled fixedly to each other together through the medium of said metal plate, and thereby providing port means for the microadjustment of vibration frequencies of both vibrator plates at the outer faces of said piezoelectric vibrator unit.

4,112,325

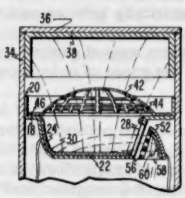
ELECTRON DISCHARGE TUBE HAVING A CUP-SHAPED SECONDARY ELECTRON EMISSIVE ELECTRODE

Richard Dale Faulkner, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 655,166, Feb. 4, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 813,075

Int. Cl.² H01J *39/04, 43/10, 43/26*

U.S. Cl. 313—95 **14 Claims**



1. An electron discharge tube comprising:

(a) an evacuated tube having a faceplate and a tubular body, with a portion of the body having a substantially circular cross-section;

(b) a cup-shaped electron emissive electrode having:

i. a substantially circular top opening;

ii. a base;

iii. a sidewall;

iv. a substantially circular rim around the periphery of said top opening, said rim projecting outward radially from said sidewall and terminating in flange having a diameter substantially equal to the diameter of the substantially circular cross-section;

v. an electron emissive coating on the inside of said cup-shaped electrode adapted to release electrons in response to impinging photons or photoelectrons; and

vi. a side opening in said sidewall through which said electrons pass to exit from said cup-shaped electrode;

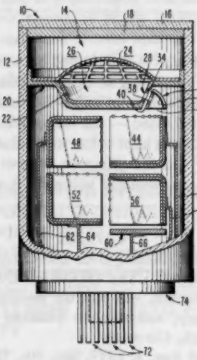
(c) said electrode positioned in the portion of the body having the substantially circular cross-section with said projecting rim substantially parallel to the plane of the substantially circular cross-section, and with said top opening facing said faceplate;
(d) means for collecting said electrons, said means positioned laterally adjacent said cup-shaped electrode between said side opening and said body; and
(e) an anode.

4,112,326

NON-UNIFORM DYNODE MESH FOR AN ELECTRON DISCHARGE TUBE

Richard Dale Faulkner, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,657
Int. Cl.[2] H01J *39/00*
U.S. Cl. 313—95 **6 Claims**



1. An electron discharge device comprising an envelope containing a photocathode, an anode, and a plurality of dynodes for propagating and concatenating electron emission from said photocathode to said anode,
said dynodes including a series of hollow, box-like secondary dynodes, each of which has an input aperture for receiving electrons from a previous stage and an output aperture for ejecting electrons to a following stage,
the input and output apertures of each of said secondary dynodes being adjacent to, and at an angle to, each other,
the input aperture of at least one of said secondary dynodes being covered by a conductive, electron-transmissive member, the electron transmission of at least a portion of which varies from a maximum at the edge thereof adjacent to the dynode's output aperture to a minimum at the opposite edge thereof.

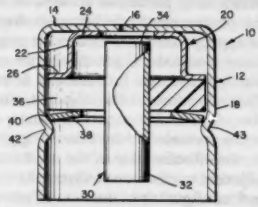
4,112,327

CATHODE STRUCTURE AND METHOD

Franz X. Eisele, Oceanside, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 18, 1976, Ser. No. 733,657
Int. Cl.[2] H01J *1/20, 19/14*
U.S. Cl. 313—337 **6 Claims**

1. A cathode structure comprising;
a cathode cup having a side wall and having a front wall therein;
a stop in said cup spaced from said front wall;
a cathode comprised of an insulator disc and a cathode tube mounted on said insulator disc, said insulator disc being engaged against said stop;
a spring engaged against said cathode insulator disc, said spring having an inner edge and an outer edge and being non-planar in its non-deflected position, said spring having said inner edge engaged against said cathode insulator disc, said spring having said outer edge positioned substantially against said sidewall of said cup and away from said cathode insulator disc in its undeflected position, said outer edge of said spring engaging against an abutment



within said cup and mounted on said cup, said abutment being positioned to hold said spring in its deflected position to force said cathode insulator disc against said stop in all conditions.

4,112,328

BARIUM MAGNESIUM FLUORIDE PHOSPHORS AND LAMPS AND X-RAY SCREENS EMBODYING SAME

Robert W. Wolfe, Wysox, and Russell F. Messier, Pennsylvania Furnace, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 615,543, Sep. 22, 1975, abandoned. This application Jan. 27, 1977, Ser. No. 763,051
Int. Cl.[2] C09K *11/46*
U.S. Cl. 313—486 **9 Claims**

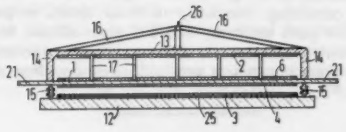
1. A luminescent composition comprising a host selected from the group consisting of barium magnesium fluoride compounds and mixtures of barium fluoride and magnesium fluoride, wherein the MgF_2 content of said host is from about 40 to about 85 mole percent and the BaF_2 content is from about 15 to about 60 mole percent and, as an activator, from about 0.01 to about 0.2 moles EuF_2 per mole of host, and from 0 to about 0.3 moles MnF_2 per mole of host.

4,112,329

GAS DISCHARGE DISPLAY DEVICE

Werner Veith, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,720
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615721
Int. Cl.[2] H01J *61/067, 61/30, 61/42*
U.S. Cl. 313—491 **15 Claims**



1. A gas discharge display device, comprising a gas-filled, gas-tight enclosure, an insulating matrix member dividing the enclosure into two chambers, which is in the form of an insulating plate having a plurality of apertures therethrough, arranged in an array of rows and columns corresponding in number to a desired number of image points, a plasma electrode disposed in one chamber, and a luminescent screen electrode disposed in the other chamber, a plurality of anode conductors disposed on the side of said plate facing said plasma electrode, and a plurality of control conductors disposed on the side of said plate facing said luminescent screen electrode,

each of the conductors extending around the edges of the associated apertures, with each of the conductors on one side being associated with a row of apertures, and each of the conductors on the other side being associated with a column of apertures, said column conductor apertures having an elongated configuration, in particular an oval or slot-shaped configuration, the plasma electrode being so disposed that upon application of appropriate potentials to the respective conductors and plasma electrode a gas discharge can burn in the discharge chamber and the luminescent screen electrode is disposed sufficiently close to the adjacent conductors on the matrix member, that under such conditions even a few kV applied to such screen electrode cannot trigger any undesired gas discharge, the effective size of the apertures in the control conductors adjacent said screen electrode having a sufficiently small size and configuration that an effective control grid action results with respect to electron flow through the aperture.

4,112,330

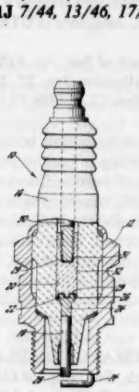
METALLIZED GLASS SEAL RESISTOR COMPOSITIONS AND RESISTOR SPARK PLUGS

Grant L. Stimson, and Patrick N. Kesten, both of Davison, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 20, 1977, Ser. No. 798,858

Int. Cl.² H01J *7/44, 13/46, 17/34, 19/78*

U.S. Cl. 315—46 **7 Claims**



1. In a glass-type resistor composition adapted to form a gas tight seal within the centerbore of a ceramic insulator between metal contact members, said composition including a metal powder to control oxidation of said metal contact members, the invention comprising the use of a glass mixture consisting essentially of about 25–50% borosilicate glass and about 50–75% barium borate glass, and the use of a mixture of metal powders consisting essentially of from about, in parts by weight, 1–4 parts antimony and 2–8 parts silicon, to obtain stable electrical resistance in field use, resistance to oxidation of metal contact members and said metal powders, and improved RFI suppression.

4,112,331

DEVICE FOR IMPROVING THE EFFICIENCY OF A LOW-PRESSURE SODIUM VAPOR DISCHARGE LAMP

Thomas Geert Verbeek, and Robertus Laurentius Clemens de Vaan, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

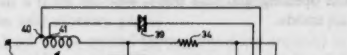
Continuation of Ser. No. 699,342, Jun. 24, 1976, abandoned. This application Dec. 9, 1977, Ser. No. 859,059

Claims priority, application Netherlands, Jun. 30, 1975, 7507734

Int. Cl.² H05B *37/02, 41/392*

U.S. Cl. 315—125 **13 Claims**

1. An illumination device comprising, a low-pressure sodium vapour discharge lamp and a current-stabilizing ballast element connected in series therewith, the lamp including a discharge tube which contains sodium and a rare gas, the lamp being provided with an infrared radiation reflecting coating which envelops a large part of the discharge tube whereby in the operating condition of the lamp the effective temperature T of



the discharge tube wall is maintained between 245° C. and 270° C., and means for supplying an operating current to the tube so that — with the exception of any peak current having a duration smaller than 0.5 msec — the instantaneous current density in the discharge tube is kept below the value $S = 165 + 1.3\,(T - 245)^2$ mA/cm² and the effective current density in the discharge tube is kept above the value 0.8 S mA/cm².

4,112,332

MATRIX-ADDRESSED GAS-DISCHARGE DISPLAY DEVICE FOR MULTI-COLORED DATA DISPLAY

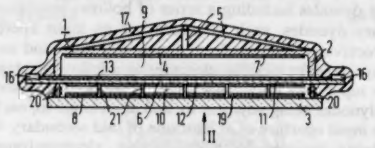
Werner Veith, Munich, and Martin Bechteler, Unterfoehring, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

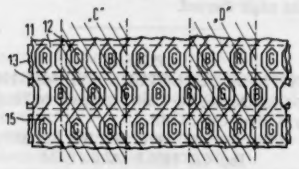
Filed Apr. 1, 1977, Ser. No. 783,570

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615569

Int. Cl.² H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169 TV **20 Claims**





1. A gas discharge display device for multicolored data display in three basic colors, comprising a gas-filled, gastight enclosure, a board-like matrix control structure, dividing the enclosure into two chambers, which is in the form of an insulating plate having a plurality of apertures therethrough, arranged in an array of coordinate lines corresponding in number to a desired number of image points, a plasma electrode disposed in one chamber, and a luminescent screen electrode disposed in the other chamber, the control structure having a plurality of auxiliary anode conductors disposed on the side of

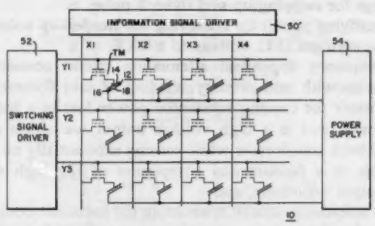
said plate facing said plasma electrode, and a plurality of control conductors disposed on the side of said plate facing said luminescent screen electrode, with each of the conductors extending around the edges of the associated apertures, each of the conductors on one side being associated with a row of apertures, and each of the conductors on the other side being associated with a column of apertures, the plasma electrode being so disposed that upon application of appropriate potentials to the respective conductors and plasma electrode a gas discharge can burn in the discharge chamber and the luminescent screen electrode is disposed sufficiently close to the adjacent conductors on the matrix member, than under such conditions even a few kV applied to such screen electrode cannot trigger any undesired gas discharge, the auxiliary anode conductors each containing a corresponding line of apertures with each three successive apertures being allotted to the three basic colors, and each third aperture being allotted to the same basic color, each control conductor interconnecting each successive aperture along the line in which such conductor extends, with each two successive apertures being allotted to two of the three basic colors and each second aperture being allotted to the same basic color, the color allocation for even-numbered auxiliary anodes is shifted relative to the odd-numbered auxiliary anodes by one aperture in the direction in which the auxiliary anodes extend.

4,112,333

DISPLAY PANEL WITH INTEGRAL MEMORY CAPABILITY FOR EACH DISPLAY ELEMENT AND ADDRESSING SYSTEM

Juris A. Asars, and Karl K. Yu, both of Murrysville Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 23, 1977, Ser. No. 780,624
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV **7 Claims**



1. A display system comprising:

(a) an X–Y display element array panel, in which X–Y row and column buses are disposed on a substrate insulated from each other for peripheral connection to drive signal means, and for interconnection of the display elements,

(b) display elements defined between the X–Y row and column intersections with a display medium disposed between spaced-apart electrodes, with an integral thin film memory transistor connected at each display element to the row and column buses and to one display element electrode,

(c) means for addressing an information potential to each floating gate of the memory transistor associated with each display element which information potential determines the conductance state for the memory transistor, which means provides a transistor turn on pulse signal applied via the selected Y bus to turn on the selected transistor if the selected transistor is not already biased on, and provides a simultaneous charge equalizing pulse signal applied via the X bus if the selected transistor is not already biased on, and wherein the information potential is thereafter applied as the sum of pulse signals applied on the selected X and Y bus for the selected display element to induce a corresponding information potential on the selected floating gate,

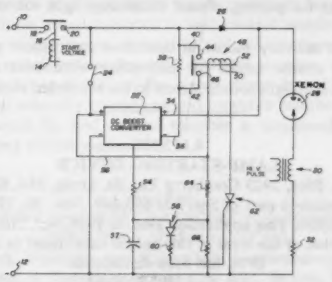
(d) means for applying a selected periodic display drive potential to a common display element electrode, with the display medium disposed between the common display element electrode and the spaced apart individual display element electrodes which are connected to a contact of the respective memory transistor associated with the display element, and including means for connecting the selected X and Y buses at a selected display element to a common reference potential relative to the periodic display drive potential to permit actuation of the display medium when the stored information potential on the floating gate of the memory transistor biases the transistor on to control the amplitude and duty cycle of signal across the display element electrodes for actuating the display element.

4,112,334

IGNITION SYSTEM FOR EXTENDING THE LIFETIME OF GAS FILLED ELECTRIC LAMPS

Leon Hodge, Garland, Tex., assignor to Varo, Inc., Garland, Tex.

Filed Jan. 28, 1977, Ser. No. 763,500
Int. Cl.[2] H05B *37/02, 41/18*
U.S. Cl. 315—171 **18 Claims**



12. An igniter circuit for extending the lifetime of a gas filled electric lamp comprising:

a D.C. boost converter for generating an open circuit D.C. voltage for application to the lamp prior to ignition of the lamp,

a resistance connected between said converter and the lamp for limiting the current applied to the lamp to a first predetermined level,

timing means connected to be energized concurrently with said converter for generating a timing signal after a predetermined time interval, and

means responsive to said timing signal for establishing a short circuit across said resistance in order to increase the current applied to the lamp to a second predetermined level higher than said first level.

4,112,335

RAPID PULSE ULTRAVIOLET LIGHT APPARATUS

Donald I. Gonser, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.

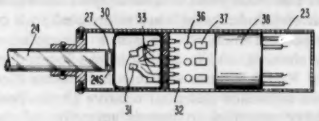
Continuation of Ser. No. 560,290, Mar. 20, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 806,316
Int. Cl.[2] H05B *37/00*
U.S. Cl. 315—241 R **14 Claims**

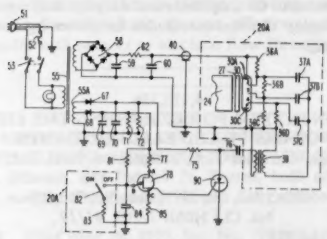
1. Light source apparatus for delivering a substantial continuum of ultraviolet radiation in the range of 320 to 400 nanometers to a restricted surface area, comprising:

a. ultraviolet light source means containing xenon at greater than 3 atmospheres and less than 10 atmospheres pressure,

and including means to cut off wavelengths below 320 nanometers;

b. a housing, adapted to contain said ultraviolet light source means and suitable for hand-held operation;





c. means for pulsing of said ultraviolet light source means; and

d. light delivery means in operative association with said light source means for delivering ultraviolet radiation from said light source means to the restricted surface area.

4,112,336

LAMP-STARTING DEVICE

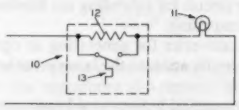
Donald J. Rios, 3923 Cranberry La., St. Louis, Mo. 63121

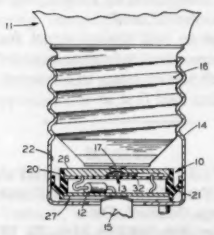
Continuation-in-part of Ser. No. 635,649, Nov. 26, 1975, Pat. No. 4,005,338. This application Dec. 6, 1976, Ser. No. 747,520

The portion of the term of this patent subsequent to Jan. 25, 1994, has been disclaimed.

Int. Cl.[2] H05B *39/02*

U.S. Cl. 315—362 **5 Claims**





1. A lamp-starting device for use in a lamp socket adapted to receive the base of a lamp, comprising:

(a) a housing,

(b) a pair of electrically-conductive plates disposed in spaced relation in the housing, and electrically insulated from each other,

(c) an electrical resistor located between and electrically connecting the plates, the resistor being in the circuit when the lamp is initially energized, and

(d) a temperature-actuated mercury switch located between the plates, the mercury switch being located in heat transfer relation to the plate that is adapted to engage the lamp base, and operatively electrically interconnecting the plates when the switch is heated by conductive heat from the lamp socket to the plate adapted to engage the lamp base to bypass the resistor in the circuit after initial energization.

4,112,337

HIGH VOLTAGE GENERATOR

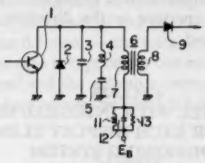
Tadashi Nagasaki; Mitsuharu Akatsu, and Mitsuo Ohtsu, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 3, 1976, Ser. No. 747,324

Claims priority, application Japan, Dec. 8, 1975, 50-145059; Dec. 8, 1975, 50-145060

Int. Cl.[2] H01J *29/70*

U.S. Cl. 315—411 **14 Claims**



1. A high voltage generator comprising:

a horizontal output circuit for generating a flyback pulse during a retrace period of horizontal scan,

a flyback transformer having primary and secondary windings for stepping up said flyback pulse,

a rectifying circuit for rectifying the steeped-up voltage for supplying a D.C. voltage to a CRT,

a frequency dependent attenuation circuit connected in series with said primary winding of said flyback transformer for causing substantial power loss in a harmonic component in a high voltage output waveform of said flyback transformer while causing substantially no power loss in a fundamental component of the high voltage output waveform, and

said attenuation circuit attenuating the harmonic component in the high voltage output waveform of said flyback transformer to flatten the top of the retrace pulse waveform of the high voltage output.

4,112,338

WIRING ARRANGEMENT FOR BLOWER MOTORS OF AN AIR CONDITIONER

Teruo Kawasaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 3, 1976, Ser. No. 738,572

Claims priority, application Japan, Nov. 19, 1975, 50-157114[U]

Int. Cl.[2] H02P *1/54*

U.S. Cl. 318—59 **11 Claims**

1. A wiring arrangement of an air conditioner for a vehicle having an electric power source, comprising:

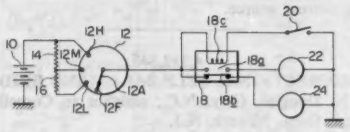
a first electric motor for driving a first blower when energized, said first electric motor and said first blower being parts of an air heating device;

a second electric motor for driving a second blower when energized, said second electric motor and said second blower being parts of an air cooling device;

voltage controlling means for controlling the magnitude of electric current directed to said first and second motors

from said electric power source so as to vary the running speeds of said first and second motors; and

switching means having first and second states thereof, said first state being a state in which said first electric motor is electrically connected to said electric power source to be energized and simultaneously, said second electric motor



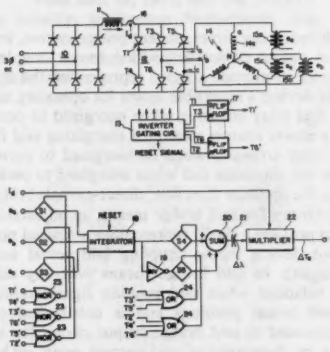
is disconnected from said electric power source to be de-energized, said second state being a state in which said first electric motor is disconnected from said electric power source to be de-energized and simultaneously, said second electric motor is connected to said electric power source to be energized.

4,112,339

MEASUREMENT OF PULSATING TORQUE IN A CURRENT SOURCE INVERTER MOTOR DRIVE

Thomas A. Lipo, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,625
Int. Cl.² H02P *5/40*
U.S. Cl. 318—227 **10 Claims**



1. A circuit for measuring the pulsating component of electromagnetic torque in an electric motor operated from a polyphase current source inverter comprising

means for effectively sensing the amplitude of the nominally rectangular inverter current supplied by said current source inverter to the motor phase windings, the zero current intervals in each phase winding, and the instantaneous voltage across each phase winding, and for generating signals respectively representative thereof, and

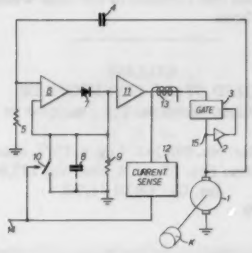
a computation circuit including means for successively integrating each phase winding voltage during the interval the current in that phase winding is zero to thereby produce signals representative of motor air gap flux, and further comprising means for filtering said flux signals to reject the direct-current component and for multiplying the flux signals by the inverter current signal to generate an output representing the instantaneous pulsating component of torque.

4,112,340

CONTROL DEVICES

Graham John Clarke, St. Albans, England, assignor to Marconi Instruments Limited, England

Filed Mar. 16, 1977, Ser. No. 778,256
Int. Cl.² H02K *27/20*
U.S. Cl. 318—331 **11 Claims**



6. A control device comprising, in combination:

a d.c. ironless motor having a rotatable member which generates a back e.m.f. when rotated;

a control member connected to said rotatable member;

storage means connected to the back e.m.f. generated by said motor for storing a signal whose amplitude is related to rotational speed imparted to said control member; and

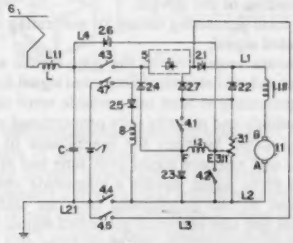
driving circuit means connect to said storage means and to said motor for rotating said rotatable member in accord with the amplitude of the signal stored by said storage means whereby rotation of said rotatable member initially imparted by said control member is continued by said driving circuit means.

4,112,341

DRIVE AND BRAKE CIRCUIT FOR SPEED CONTROLLED DC MOTORS

Horst Fath, Weinheim, and Reiner Nill, Leutershausen, both of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Dec. 15, 1976, Ser. No. 750,671
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557208
Int. Cl.² H02P *3/14*
U.S. Cl. 318—370 **24 Claims**



1. For a DC motor having a field winding and an armature winding, a drive and brake circuit comprising a choke, a DC controller, a rectifier, a brake resistance, a first diode, said brake resistance and said first diode being connected in series with each other and across the field winding, a plurality of switches, circuit means including the plurality of said switches for forming a series connection of the field winding and said rectifier and connecting the series connection parallel to the armature winding so as to drive the motor and for connecting the brake resistance in series with the rectifier and connecting

the series connected brake resistance and rectifier parallel to the armature winding to brake the motor, said rectifier being ignitably controllable, a second diode, an extinguishing diode in the controller, said brake resistor having a terminal, a third diode, said field winding having two field winding terminals, two choke terminals on the choke, said second diode being connected between the extinguishing diode of the controller and one terminal of said brake resistor, said third diode being connected between one terminal of the field winding and one terminal of the choke.

4,112,342

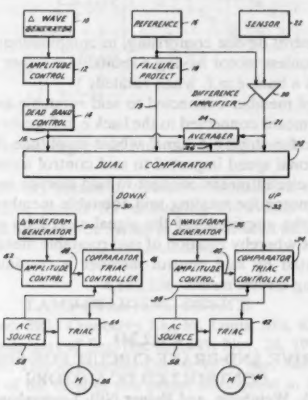
SOLID STATE CONTROLLER

Harry Samuel Elliott, Houston, Tex., assignor to Varco, Inc., Houston, Tex.

Continuation of Ser. No. 495,142, Aug. 6, 1974, abandoned. This application Sep. 27, 1976, Ser. No. 727,001

Int. Cl.[2] G05B *11/28*

U.S. Cl. 318—599 **28 Claims**



1. A control system using a power supply for positioning a device associated with a physical variable wherein the position of the device is controlled by an alternating current electric prime mover driven by an alternating current source and the position of the device is represented by a state signal whose variable amplitude is a function of the position, comprising:

means responsive to the physical variable for generating a reference input signal of settable magnitude representing a desired position of the device;

a first wave form generating means for generating an electrical generated signal;

difference means responsive to the state signal, said reference signal and said electrical generated signal for simultaneously generating at least one variable error signal having a magnitude and polarity only proportional to a difference relationship between the magnitudes of the state signal and said refernce signal over time and at least one generated error signal having a magnitude and polarity proportional to the relationship between said variable error signal and said electrical generated signal; said error signals having waveforms differing from said electrical waveform, and said electrical generated signal and said error signals being coordinated in time;

comparator means responsive to said difference means and said first waveform generating means for producing first variable duration output pulses at a plurality of outputs; said variation of duration being a function in time of the magnitude of said electrical generated signal and said variable error signal, said difference means being electrically connected between the state signal and said reference signal and said comparator means, and said first waveform generating means being electrically connected between said comparator means and the power supply; and

a solid state switching means responsive to said outputs of said comparator means for switching power to the alternating current electric prime mover to vary the position of the device, said solid state switching means being electrically connected between said comparator means and the alternating current electric prime mover and the alternating current source.

4,112,343

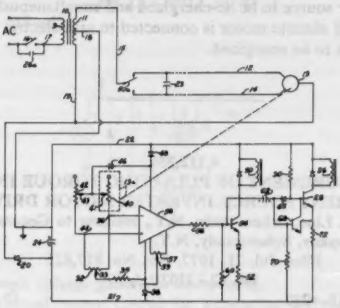
BIDIRECTIONAL SELF BALANCING BRIDGE

Philip N. Douglas, Cary, N.C., assignor to Cornell-Dubilier Electric Corp., Newark, N.J.

Continuation of Ser. No. 545,146, Jan. 29, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,554

Int. Cl.[2] G05B *1/06*

U.S. Cl. 318—674 **25 Claims**



1. A self-balancing direct current bridge system, including a mechanical output device; a position sensor coupled to said output device to provide a signal representing the actual position of said device; a reversible motor for operating said output device; a first relay effective when energized to connect said motor to a power source; means for energizing said first relay; a second relay arranged when de-energized to permit motor rotation in one direction and when energized to permit motor rotation in the opposite direction; direct-current bridge means; an output circuit for said bridge means; an adjustable control element to provide a signal representing a desired position for said output device, means coupling said actual and desired position signals in said bridge means whereby said bridge means is balanced when said position signals represent like desired and actual positions and is unbalanced otherwise; means connected to said bridge output circuit for selectivity energizing or deenergizing said second relay such that the motor operates to restore the bridge means to its balanced condition; said output circuit including means responsive to the rate of change of bridge balance to produce a control signal; and means responsive to any polarity reversal of the rate of change of bridge balance for de-energizing said first relay and thereby de-energizing said motor.

4,112,344

RECORD FEEDING APPARATUS AND METHOD

Rudolph J. Klein, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

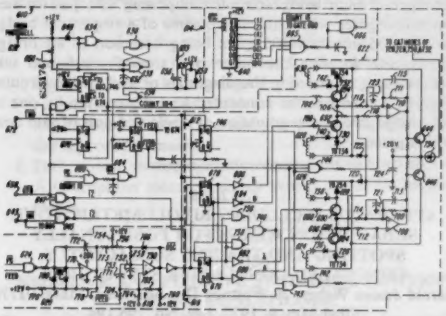
Division of Ser. No. 537,481, Dec. 30, 1974, Pat. No. 4,002,277. This application Feb. 4, 1976, Ser. No. 655,174

Int. Cl.[2] G05B *19/40*

U.S. Cl. 318—685 **11 Claims**

1. A control system for a stepping motor having a drive shaft and a plurality of windings, the sequential electrical energization of said windings being effective to rotate said drive shaft in predetermined increments, the control system comprising:

means for alternately energizing the windings in a predetermined sequence, the energizing means including means for altering the sequence to change the magnitude of the increments; and means connected to said energizing means for



determining the rate at which the windings are energized, said rate determining means including means for gradually increasing the energizing rate for accelerating the stepping motor and for gradually decreasing the energizing rate for decelerating the stepping motor.

4,112,345

STEPPING MOTOR WITH ENERGIZING CIRCUIT

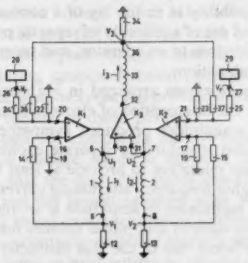
Bernardus Henricus Antonius Goddijn, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,027

Claims priority, application Netherlands, Feb. 24, 1976, 7601844

Int. Cl.[2] H02P *1/40*

U.S. Cl. 318—696 **8 Claims**



1. A stepping motor and energizing circuit which comprises: a stepping motor having a rotor, first and second phase windings, and means for the stepwise energization of said first and second phase windings simultaneously including first and second sources having a high internal resistance relative to said first and second phase windings, said sources supplying energizing currents to said first and second phase windings to be energized, and an active network for generating a first current at a first output and a second current at a second output, said first and second currents being substantially in phase opposition and each having a magnitude which is a function of the difference between the voltages across said first and second phase windings, said first output being connected to said first phase winding and said second output being connected to said second phase winding to actively damp movement of said rotor.

4,112,346

CONSTANT CURRENT CIRCUIT

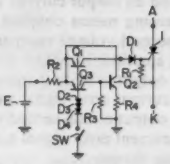
Michio Tokunaga, Zushi; Ichiro Ohhinata, Yokohama, and Shinzi Okuhara, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 9, 1977, Ser. No. 823,197

Claims priority, application Japan, Aug. 11, 1976, 51-94881

Int. Cl.[2] G05F *1/56*

U.S. Cl. 323—4 **7 Claims**



1. A constant current circuit comprising: characteristic-correlated first and second PNP transistors having common-connected emitters and common-connected bases, and

an NPN transistor whose base is connected to the collector of said second PNP transistor and whose collector is connected to said common-connected emitters of said first and second PNP transistors in which constant current is derived from the collector of said first PNP transistor.

4,112,347

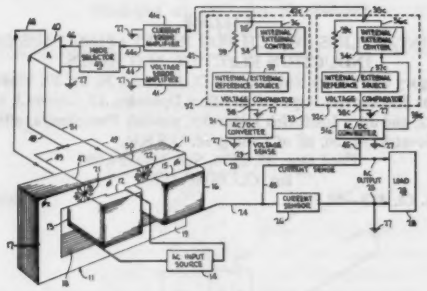
CONVERSION AND CONTROL OF ELECTRICAL ENERGY BY ELECTROMAGNETIC INDUCTION

Nathan A. Moerman, 7310 Maple Ave., Chevy Chase, Md. 20015

Division of Ser. No. 635,007, Nov. 25, 1975, Pat. No. 4,020,440. This application Jan. 26, 1977, Ser. No. 762,896

Int. Cl.[2] G05F *1/14*

U.S. Cl. 323—6 **7 Claims**



7. An electromagnetic induction means for the control and stabilization of alternating current power at a load from an alternating current power source comprising,

an alternating current power transformer means including a first closed magnetic path about an input leg and an output leg, and a second closed magnetic paths about the input leg and a bypass leg,

a first permeance control section coupling said input leg to the output leg in said first closed magnetic path, and

a second permeance control section coupling said input leg to the by-pass leg in said second closed magnetic path,

an alternating current power input winding means surrounding said input leg,

an alternating current power output winding means surrounding said output leg,

said output winding means having a pair of output leads,

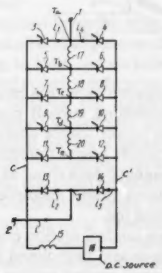
a load current sensor means,

a load terminal means connected to one of said output winding leads in series with said current sensor means,
a first voltage comparator means including a stabilized voltage reference and an output voltage setting control means,
a voltage feedback means coupled from said load terminals to said first voltage comparator means,
a voltage error signal amplifier means,
means connecting the output of said first voltage comparator means to said voltage error signal amplifier means,
a second voltage comparator means including a stabilized reference voltage and an output current setting control,
a feedback current sensing means coupled to said current sensor and to said second voltage comparator means,
a current error signal amplifier means,
means connecting the output of said second voltage comparator means to said current error signal amplifiers means,
means connecting the output of said second voltage comparator means to said current error signal amplifier means,
a control mode selector means,
means connecting the outputs of said voltage error amplifier means and said current error amplifier means as the inputs to said control mode selector means, and
a permeance control complementary amplifier means coupling said mode selector means and said first and second permeance control sections for selectively apportioning the magnetic flux between said first and second closed magnetic paths while maintaining the magnetic flux in said input leg relatively constant,
whereby electromagnetic induction in said alternating current power output winding means produces a stabilized alternating current voltage at the terminals of said load means in response to said first voltage comparator means with said control mode selector means enabling voltage mode operation,
whereby electromagnetic induction in said alternating current power output winding means produces a stabilized output alternating power current to said load means in response to said second voltage comparator means and with said control mode selector means enabling current mode operation.

4,112,348
CONTACTLESS SWITCH FOR REGULATING TAPS OF INDUCTION ELECTRIC MACHINES

Grigory Markovich Rubashev, V.O. 15 Linia, 34, kv. 37; Vladislav Ruvimovich Alperovich, ulitsa Dybenko, 27, korpus 3, kv. 22, and Jury Iosifovich Lazovsky, poselok Pesochnaya, ulitsa Sovetskaya, 26, all of Leningrad, U.S.S.R.

Filed Dec. 27, 1976, Ser. No. 754,680
Int. Cl.[2] G05F *1/20*
U.S. Cl. 323—43.5 S **6 Claims**

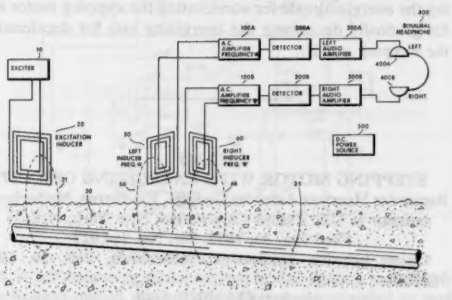


1. A contactless switch for regulating taps of inductive electric machines, comprising a plurality of series-connected induction machine coils the terminals of which define a plurality tapping steps or taps: a pair of electrical conductors; a pair of controlled gates connected between each of said taps and another one of said electrical conductors; a pair of uncontrolled gates connected in series to each other to form a junction point and connected to said electrical conductors; and a reactor connected between said electrical conductors, said gates being arranged to form one of a plurality of single-phase bridge circuits when a pair of controlled gates are rendered conductive, each bridge circuit comprising one pair of said controlled gates which form two arms of a respective bridge circuit, said uncontrolled gates being common to all bridge circuits and forming the other two arms thereof, and said reactor being disposed in the diagonals of said bridge circuits, whereby a load may be connected to a desired tap by one of said bridge circuits by actuation of a selected pair of said controlled gates.

4,112,349
APPARATUS INCLUDING BIVOLUMETRIC TONE SUBAUDITION MEANS FOR POSITIONALLY SPOTTING AND TRACING SUBJACENTLY CONCEALED CONDUCTIVE STRUCTURES

Harold James Weber, 20 Whitney Dr., Sherborn, Mass. 01770

Filed May 9, 1977, Ser. No. 795,194
Int. Cl.[2] G01V *3/10*
U.S. Cl. 324—3 **12 Claims**



1. A receptor apparatus wherein the utility lies as a means for providing improved acuity and sense of relative, say, right or left hand, perceptibility as to the lay of a concealed structure through the novel use of a plurality of separate position indicative sensory indications to an operator, said receptor including in operative combination;

a. Plural inducer means arranged in a noncoincident relationship for the interception of electromagnetic field lines of various magnitudes produced sympathetically in the said concealed structure by separate exciter means, said exciter means operative to provide at least two distinctly different higher frequency alternating current signals each of which is modulated in amplitude at an audio frequency rate, wherein each of said plural inducer means is responsive to a different one of the said distinctly different frequencies so as to provide minute alternating current levels proportional to the relative power of the said electromagnetic induction field lines at the respective frequency intercepted by each of the said plural inducers,
b. A.C. amplifier means, with plural inputs connected to said plural inducer means, operative to independently amplify said minute alternating current levels produced by each of the operatively connected plural inducer means to provide plural different frequency output signals of increased amplitude, each of said different frequency output signals being proportional to each of the respective plural minute alternating current level AC amplifier inputs,
c. a plurality of detector means, each operative to detect a respective one of the different frequency plural A.C. amplifier output signals from the operatively connected A.C. amplifier means for producing plural audio signal outputs from said detector means, each audio signal output being proportional in amplitude to a respective one of the said minute alternating current level inputs,

d. Audio amplifier means coupled to the output of each of the detector means operative to independently amplify each of the said plural audio signal outputs derived from said detector means,

e. Audio reproducer means comprising a plurality of separate transducers with at least one of said transducers coupled to each of the said audio amplifier means to provide at least two audio tone sensations for the operator consisting of at least a left ear signal and a right ear signal the respective volumes of which are individually proportional to a respective one of the said plural audio signal inputs to the reproducer means,

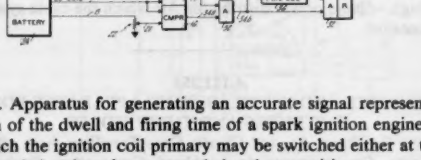
f. D.C. power source operative connected to each the said A.C. amplifier means, detector means, and audio amplifier means.

4,112,350

NEGATIVE AND POSITIVE SWITCHING IGNITION SIGNAL CONDITIONER

Thomas G. Van Vessem, Enfield, and Paul R. Back, Somersville, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 15, 1977, Ser. No. 833,633
Int. Cl.[2] F02P *17/00*
U.S. Cl. 324—16 R **2 Claims**



1. Apparatus for generating an accurate signal representation of the dwell and firing time of a spark ignition engine in which the ignition coil primary may be switched either at the grounded end or the ungrounded end, comprising:

first means for comparing the low coil signal against a positive reference voltage which is between the highest voltage that the low coil signal can reach in the dwell period and the lowest peak voltage which the low coil signal can reach during ignition-defeated operation in a negatively switched ignition system to provide a first signal related in time to the end of dwell period;

second means for comparing the low coil signal against a reference voltage which is between the most negative voltage that the high coil signal can reach in the dwell period and the lowest negative peak voltage which the low coil signal can reach during ignition-defeated operation in a positively switched ignition system to provide a second signal related in time to the end of a dwell period;

third means for comparing the low coil signal against a substantial faction of the voltage of the battery of the engine to provide a third signal related in time to the beginning of the dwell period;

fourth means for comparing the high coil signal against a small positive reference voltage which is lower than any voltage which occurs within the dwell period of a positively switched ignition system to provide a fourth signal related in time to the beginning of the dwell period; and

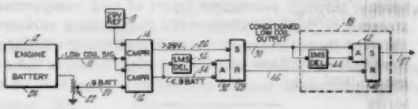
output means connected for response to said first, second, third and fourth means, and operative at the end of dwell period in response to either said first signal or said second signal and operative at the end of the dwell period in concurrent response to both said third signal and said fourth signal, for providing a signal delineating the dwell period from the firing time without regard to whether the ignition system under test is positively switched or negatively switched.

4,112,351

DUAL THRESHOLD LOW COIL SIGNAL CONDITIONER

Paul R. Back, Somersville, and Thomas G. Van Vessem, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 1, 1977, Ser. No. 829,857
Int. Cl.[2] F02P *17/00*
U.S. Cl. 324—16 R **3 Claims**



1. Apparatus for generating an accurate signal representation of the dwell and firing time of a spark ignition engine comprising:

first means for comparing the low coil signal against a reference voltage which is between the highest voltage that the low coil signal can reach in the dwell period with the lowest peak voltage which the low coil signal can reach during ignition-defeated operation to provide a signal related in time to the end of a dwell period;

second means for comparing the low coil signal against a substantial fraction of the voltage of the battery of the engine to provide a signal related in time to the beginning of a dwell period; and

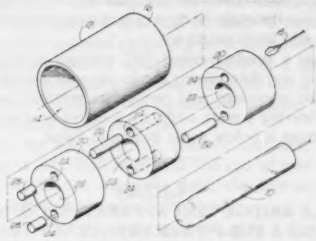
output means responsive to said first and second comparing means for providing a signal delineating the dwell period from the firing time.

4,112,352

ELECTROCHEMICAL REFERENCE CELL WITH IMPROVED LIQUID JUNCTION

Theodore R. Barben, II, Carson City, Nev., assignor to Thomas Barben Instruments, Carson City, Nev.

Filed Oct. 11, 1977, Ser. No. 841,169
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—30 R **16 Claims**



1. A reference cell for use in measuring the pH of a sample fluid stream comprising:

an elongated rigid enclosure having an open end exposed to said sample fluid and a closed end;

at least two transversely adjacent longitudinal series of plug means disposed in longitudinally overlapping relationship with an interlocking fit to fill the open end of said enclosure;

a reference cell containing a reservoir electrolyte solution in contact with said cell means at the opposite end of said enclosure and separated from said sample fluid by said plug means;

each of said plug means consisting of successive longitudinally disposed layers of semipermeable material permeated with said electrolyte solution;

an impermeable seal between abutting transverse end surfaces of said plug means in each series and joined to the surrounding longitudinal surfaces of the overlapping adjacent plug means and said enclosure at approximately midway between the end portions of the adjacent series, the outer end surface of at least one plug means exposed to said sample fluid at the open end being unsealed to provide fluid communication between said layers;

whereby an ion transfer path between said sample fluid stream and said electrolyte solution is established transversely through successive layers of said semipermeable material in passing between the longitudinal surfaces of the plug means in one series to the abutting overlapping longitudinal surfaces of adjacent plug means in the other series.

4,112,353

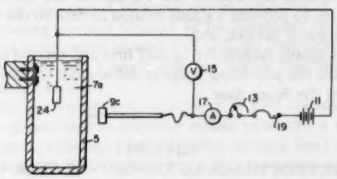
METHOD FOR TESTING DIELECTRIC ADEQUACY AND FOR INDICATING PHYSICAL DEFECTS IN A NONCONDUCTING MATERIAL BY DEPOSITING TRACES OF CARBON ON THE MATERIAL

Robert W. Thompson, Pearland, Tex., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 603,074, Aug. 8, 1975, Pat. No. 4,010,416. This application Sep. 21, 1976, Ser. No. 725,314

Int. Cl.[2] G01R *31/12*

U.S. Cl. 324—54 **2 Claims**



1. A method for testing a personnel container for physical defects and dielectric adequacy, comprising the steps of:

placing an ionic solution in the container;

placing a first electrode in said solution;

passing a second electrode having a wiper blade formed from an elastomer filled with conductive particulate material over the outer portion of said container which is filled with said ionic solution;

imposing a predetermined DC voltage across said electrodes, and determining the location of a mark of smudge on said container, said particulate material in the elastomer leaving a mark outlining a defect or a smudge if the thickness is below some minimum value.

4,112,354

MOBILE BRIDGE TEST APPARATUS AND METHOD UTILIZING A SUB-POWER FREQUENCY TEST SIGNAL FOR CABLE SYSTEM EVALUATION

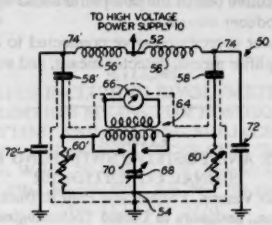
George Bahder, Edison; George S. Eager, Jr., Upper Montclair, and Rafael Suarez, Avenel, all of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Nov. 9, 1976, Ser. No. 739,847

Int. Cl.[2] G01R *31/12, 27/00*

U.S. Cl. 324—54 **9 Claims**

1. Mobile field-test apparatus for the partial-discharge testing of a given length of an installed shielded high-voltage multiple-cable system when the cable conductors of the given length of the system have been disconnected from the system at predetermined spaced points, the shields being left in installed grounded condition, said apparatus comprising a bridge having two sides and interconnected at their opposite ends, one of said ends including a high-voltage connection and the other of said ends including a low-voltage balancing network having a ground connection, corresponding inductive and capacitative reactance elements similarly and series-interconnected in each side of said bridge, the inductive elements being connected to said high-voltage connection and the low-voltage ends of the capacitative reactance elements being connected to corresponding parts of said balancing network, first means for connecting one conductor of a disconnected high-voltage cable-system length under test to the interconnection of the reactance elements of one side of said bridge, second means for connecting a second conductor of the disconnected cable system to the interconnection of the reactance elements of the



other side of said bridge, said balancing network including a transformer having a primary connecting the low-voltage sides of the respective capacitative reactance elements, meter means connected across the secondary of said transformer, and a high-voltage power source connected to the respective ends of said bridge, said power source being characterized by an output voltage which varies between zero and high voltage at a rate which is very substantially more slow than the cyclic rate of high-voltage power distribution for which the cable system is installed.

4,112,355

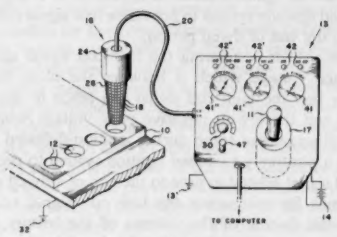
QUALITY AND FIT MEASURING APPARATUS FOR FASTENERS AND THEIR HOLES

Harry S. Gibson, Jr., and Charlie Gene Trevillion, both of Atlanta, Ga., assignors to Lockheed Corporation, Burbank, Calif.

Filed Oct. 22, 1976, Ser. No. 734,805

Int. Cl.[2] G01R *27/00*

U.S. Cl. 324—57 R **7 Claims**



1. A quality and fit measuring apparatus for fasteners and their holes in structural members to be joined by such fasteners when installed therein comprising in combination:

a control box including a source of electrical power and a plurality of indicators;

a computer operatively connected to said control box;

a probe having a surface conforming in size and shape to that of the shank of each said fastener, said probe surface being defined by a plurality of capacitors electrically connected to said control box;

a receptacle having a surface conforming in size and shape to the surface of said members defining said holes, said receptacle surface being defined by a plurality of capacitors electrically connected to said control box;

a first electrical circuit within said control box including an

individual conductor between each said probe capacitor and said computer;

a second electrical circuit within said control box including an individual conductor between each said receptacle capacitor and said computer;

a stepping switch in each of said first and second circuits operative to make and break connection of each probe and receptacle capacitor with said computer in a predetermined sequence; and

a connection between said first and second circuits between said stepping switch and said computer to coordinate corresponding capacitors of said probe and said receptacle during operation of the stepping switch as aforesaid when said probe is located in the structural member holes and the fastener shank aforesaid is located in said receptacle whereby comparisons between the fastener and hole surfaces are made by the computer and registered by said indicators.

4,112,356

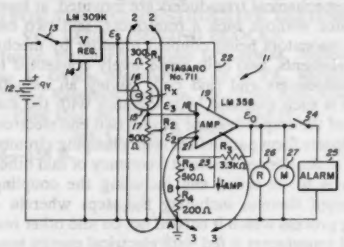
SEMICONDUCTOR GAS DETECTOR CIRCUIT

Stephen M. Toy, 4190 Manuela Ave., Palo Alto, Calif. 94306

Filed Dec. 20, 1976, Ser. No. 752,413

Int. Cl.[2] G01N *27/00*

U.S. Cl. 324—71 SN **11 Claims**



1. In a semiconductive gas detector circuit:

semiconductive gas detector means disposed in gas communication with a gas to be detected and having a sensing resistor means with a value of resistance which varies in accordance with the concentration of the gas constituent to be detected and also having a temperature coefficient of resistance of a first polarity;

second resistor means series connected with said sensing resistor means to form a voltage divider network therewith which is to be connected across a source of voltage and having an output node connected intermediate said sensing and second resistor means on which is established a first output signal which varies in accordance with the concentration of the detected gas constituent and which has a temperature dependence;

differential amplifier means having first and second signal input terminals, an output signal terminal and a pair of power supply terminals, for supplying a flow of current through said differential amplifier means, the value of supply current having a temperature coefficient of current of a second polarity opposite to that of said first polarity, means for coupling said first output signal into said first input terminal of said differential amplifier means;

third and fourth resistor means series connected to form a second voltage divider network and being connected across the output of said differential amplifier means for voltage dividing thereacross the output signal of said differential amplifier means and having a feedback signal node between said third resistor means and said fourth resistor means on which to derive a feedback signal which varies as the output signal, a supply current node disposed between said fourth resistor means and said third resistor means, means for applying the supply current of said differential amplifier means through said fourth resistor means, to derive a temperature compensation feedback signal component of said feedback signal and means for coupling said feedback component signal into said second input terminal of said differential amplifier means; and

the ratio of the resistance value of said second resistor means to that of said fourth resistor means being such as to compensate for the temperature dependence of said first output signal.

4,112,357

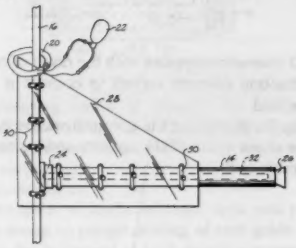
LIGHTING CURRENT DETECTOR

Stephen F. Livermore, Satellite Beach, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 22, 1977, Ser. No. 835,544

Int. Cl.[2] G01R *31/02*

U.S. Cl. 324—72 **7 Claims**



1. An apparatus for measuring the intensity of a current produced in an elongated electrical conductive member by a lightning strike for determining the intensity of said lightning strike, said apparatus comprising:

(a) an elongated strip of magnetic material,

(b) means for holding said elongated strip of magnetic material perpendicular to said elongated electrical conductive member,

(c) a predetermined electrical signal recorded along the length of said elongated strip of magnetic material,

(d) one end of said magnetic material being positioned closely adjacent said electrical conductive member with the magnetic material extending perpendicularly outward from said electrically conductive member a greater distance than the distance of a magnetic field that is produced by current induced in said conductive member caused by an anticipated lightning strike,

whereby by analyzing the distance that said recorded signal is disturbed from said one end of said magnetic material by the magnetic field, the intensity of said lightning strike can be determined.

4,112,358

DIGITAL FREQUENCY MEASURING DEVICE

Hitoshi Ashida, Gyoda, Japan, assignor to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Apr. 8, 1977, Ser. No. 785,909

Claims priority, application Japan, Apr. 9, 1976, 51-40655

Int. Cl.[2] G01R *23/02*

U.S. Cl. 324—78 D **5 Claims**

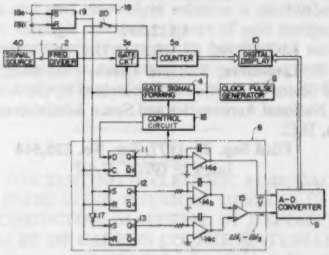
1. A digital frequency measuring device comprising:

a gate circuit supplied with an input pulse signal to be measured in frequency and controlled by a gate signal to be opened and closed;

a gate signal forming circuit for generating and supplying the gate signal of unit time to the gate circuit;

a counter supplied with the input pulse signal having passed through the gate circuit to count the input pulses;

a fraction detector circuit supplied with the gate signal and the input pulse signal for performing an operation $(\Delta T_1 - \Delta T_2)/T$ where ΔT_1 and ΔT_2 are the time intervals between the leading and trailing edges of the gate signal and the input pulses respectively following them in predetermined relationships thereto, and T is the period of the input pulse signal;



an A–D converter supplied with the result of operation from the fraction detector circuit to convert it into a digital value; and

a display for displaying the output from the A–D converter as the count value of the counter and a number below its minimum unit.

4,112,359

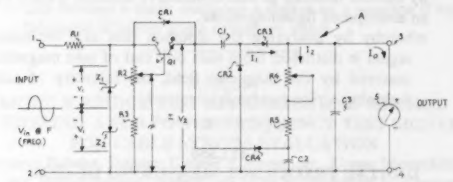
FREQUENCY TRANSDUCER CIRCUIT WITH OUTPUT CALIBRATION

Donald R. Hyer, Lynnfield, Mass., assignor to General Electric Company, New York, N.Y.

Filed Apr. 15, 1977, Ser. No. 787,907

Int. Cl.[2] G01R *23/02*

U.S. Cl. 324—78 E **10 Claims**



1. A frequency transducer circuit for providing a precisely adjusted range of output currents, comprising a diode pump circuit in combination with a low impedance input circuit including a first transistor having its collector and emitter connected in series with the primary capacitor of the diode pump circuit, a first variable impedance means operably connected for adjusting the current output of said first transistor thereby to adjust output current of the transducer circuit at the upper limit of said range, and a second variable impedance means connected to provide biasing current to the output of said transistor for adjusting output current of the transducer circuit at the lower limit of said range.

4,112,360

APPARATUS AND METHOD FOR TUNING ELECTRO-MECHANICAL FILTER COMPONENTS

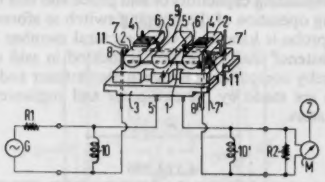
Horst Bergmann, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 7, 1977, Ser. No. 766,075

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608137

Int. Cl.[2] G01R *23/00*

U.S. Cl. 324—80 **5 Claims**



1. A process for the tuning of a resonator by frequency adjustment of an electromechanical filter which comprises two electromechanical transducers capable of operating in electrostrictive action, two end mechanical resonators on which said electromechanical transducers are mounted, at least one other resonator without such a transducer, said two end and said other resonators being coupled together by mechanical coupling elements, two coils respectively connected to said two end transducers and said coils having an inductance value which is such that said coils together with the static capacitance of the respective one of said two end electromechanical transducers form parallel resonant clamping circuits which are tuned to the desired resonant frequency of said other resonator which is to be tuned and including the coupling elements connected thereto, including the steps wherein during the tuning process which is carried out on said other resonator one of said transducers is fed with electrical energy tunable over a frequency range from a feed circuit which has sufficient high ohmic impedance to assure that the quality factor of this clamping circuit is only slightly changed, the resonator connected to this clamping circuit thereby feeding said other resonator with low amplitude mechanical oscillations of the desired frequency, and simultaneously the resonant output frequency of said other resonator is measured by a measuring circuit having a high input impedance connected to one of said clamping circuits.

4,112,361

LIQUID CRYSTAL APPLIED VOLTMETER

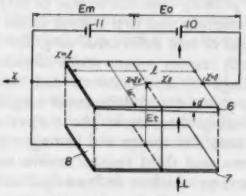
Takashi Nakada, and Toshiharu Takoh, both of Tokyo, Japan, assignors to Tokyo Seimitsu Co. Ltd., Japan

Filed Jun. 1, 1976, Ser. No. 691,664

Claims priority, application Japan, Jun. 5, 1975, 50-67857; Feb. 20, 1976, 51-017786; Mar. 11, 1976, 51-026564

Int. Cl.[2] G02F *1/13*

U.S. Cl. 324—92 **4 Claims**



1. A decibel meter comprising:

(a) a pair of polaroidal plates disposed in parallel opposed

position, said polaroidal plates being arranged so that their polarizing directions intersect at a right angle,

(b) a pair of light-transmitting electrodes disposed in spaced parallel relationship between said polaroidal plates, one of said electrodes comprising an electrical resistance film, the other of said electrodes comprising a conductor film, one end of said electric resistance film being electrically connected to one end of said conductor film,

(c) a nematic liquid crystal, adapted to produce a DAP effect, filling a space defined between said electrodes

(d) a scale indicating means on one of said polaroidal plates on a surface thereof which is remote from said liquid crystal, said scale means having graduations at substantially equal intervals

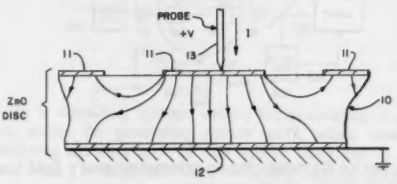
(e) a constant voltage power supply electrically connected to said one electrode comprising said electrical resistance film for applying a constant voltage to thereto such that a voltage gradient occurs from one end to the other of said electrode, the resistance value per unit length of said resistance film from one end to the other of said film varying as the inverse of an exponential function, said constant voltage and a voltage to be measured being applied in series across the two ends of said electrical resistance film.

4,112,362

METHOD FOR THE NONDESTRUCTIVE TESTING OF VOLTAGE LIMITING BLOCKS

Philip L. Hower, Pittsburg; William G. Carlson, Murrysville, and Tapan K. Gupta, Monroeville, all of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 30, 1976, Ser. No. 755,619
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—158 R **3 Claims**



1. A method for the nondestructive testing of voltage limiting blocks comprising the following steps: placing a plurality of discrete electrical contacts on one surface of a block and a full electrode on the opposite surface of the block; sequentially applying a voltage to each contact and measuring the resultant current; deriving from said voltage and current empirical constants representative of the particular microstructure of said block in proximity to a respective contact; utilizing said derived constants to effectively draw a contour map of current density across said block; and determining the maxima of said contour to permit the calculation of a quality rating of said block.

4,112,363

MULTICONTACT TEST PROBE APPARATUS

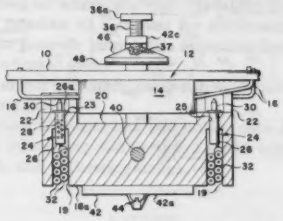
Robert A. Morrison, Granada Hills, and Lyle C. Armstrong, Sunland, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 27, 1976, Ser. No. 754,346
Int. Cl.[2] G01R *31/02, 1/06*
U.S. Cl. 324—158 P **4 Claims**

1. A test probe apparatus adaptable to connect with an integrated circuit device which is mounted on a circuit board and which has a plurality of electrical contact tabs protruding therefrom, said test probe comprising:

guide means including an elongated channel having a side slot for each of said contact tabs, the body portion of said integrated circuit device adapted to closely fit within said elongated channel whereby said circuit device is in a preselected position for testing thereof;

a plurality of separate spaced apart electrical contact probes mounted within said housing in a pattern to contact said tabs at an angle substantially normal thereto when said circuit device engages said housing, each said contact probe being resiliently biased normal against the engaged tab with a pressure not sufficient to damage the connection of said tab to said circuit device;



releasable clamping means for engaging the surface of said circuit board away from said circuit device and the surface of said guide means away from said guide means for securing said housing in engaged position with said integrated circuit device;

said guide means is pivotally mounted upon said releasable clamping means to permit canting of said guide means at various angles in respect to said clamping means; and

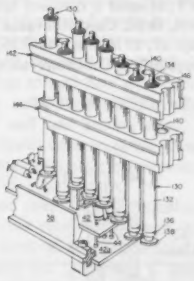
a separate conductive wire connected to each of said probes for testing said circuit device.

4,112,364

CIRCUIT BOARD TESTING APPARATUS

Jonathon H. Katz, Brookline, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Apr. 4, 1977, Ser. No. 784,266
Int. Cl.[2] G01R *31/02, 15/12*
U.S. Cl. 324—158 F **7 Claims**

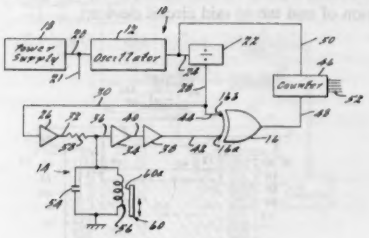


1. A circuit board test apparatus comprising; a weighting assembly having a frame and an array of weights mounted in said frame, each of said weights having a body portion mounted for independent free vertical sliding in said frame and a tip for contacting electrical elements loaded on said board and beneath said weights; and a multiplicity of test pins extending upwardly beneath said board; said weights being heavy enough to hold said board in electrical contact with said pins.

4,112,365
POSITION DETECTING SYSTEM

Gerald L. Larson, Battle Creek, and Walter K. O'Neil, Southfield, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 15, 1977, Ser. No. 768,928
Int. Cl.[2] G01R *15/12*
U.S. Cl. 324—173 32 Claims

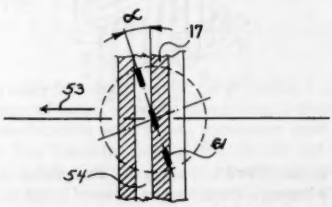


1. An electronic system comprising:
means for producing a first square wave cyclic signal;
a resonant circuit including reactive means, said resonant circuit excited by said first cyclic signal and operative to produce a second cyclic signal shiftable in phase relative to said first cyclic signal in response to changes in effective impedance of said resonant circuit:
coupling means movable relative to said reactive means and operative in response to such relative movement to change said effective impedance and shift the phase of said second cyclic signal relative to the phase of said first cyclic signal;
wave shaping means operative to shape said second cyclic signal into a second cyclic square wave signal; and
detector means operative to produce a cyclic output signal having an amplitude independent of the difference in phase between said first and second square wave cyclic signals and having a duty cycle representative of the difference in phase between said first and second square wave cyclic signals.

4,112,366
ELECTROMAGNETIC DISPLACEMENT SCANNER USING AN E-SHAPED CORE OBLIQUE TO THE SCAN DIRECTION

Oldrich Kouril, and Jaroslav Knourek, both of Brno, Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Filed Sep. 27, 1976, Ser. No. 726,576
Claims priority, application Czechoslovakia, Sep. 25, 1975, 6470-75
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—208 5 Claims

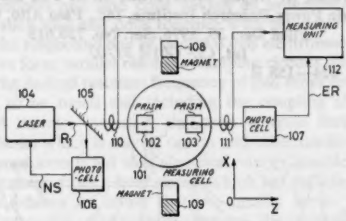


1. In an electromagnetic scanner positionable opposite a regularly grooved ferromagnetic surface relatively movable with respect to the scanner in a first predetermined direction at a first rate for generating, at the output of the scanner, an electrical indication variable at the first rate as the grooves move relatively to the scanner, said scanner comprising a substantially flat, E-shaped magnetic core having a crosspiece and three parallel arms disposed in space relation and extending outwardly from the crosspiece toward the grooved surface, at least two of the arms of the core terminating in aligned relation to define a first surface parallel to and spaced a predetermined distance from the grooved surface to establish an air gap therebetween, and first and second coils positioned in parallel relation around and coaxial with the crosspiece of the core between the respective outer arms of the core and the central arm thereof, the ferromagnetic surface exhibiting a series of teeth and grooves regularly spaced in alternating relation in the first direction, the plane of the core being oblique to the first direction and to said grooves, the maximum thickness of the core in the first direction being equal to half the width of the groove in the first direction.

4,112,367
MAGNETOMER USING A THIN MAGNETIC FILM OPTICAL WAVEGUIDE WITH A.C. MODULATION AND AUTOMATIC NULLING

Georges Hepner, and Bernard Désormière, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 14, 1977, Ser. No. 806,479
Claims priority, application France, Jun. 18, 1976, 76 18600
Int. Cl.[2] G01R *33/02*
U.S. Cl. 324—244 7 Claims



1. A device for measuring an external magnetic field having a given direction, which comprises:
means for generating a first light beam having a linear polarization;
a thin film of magnetic material immersed in said external magnetic field and extending along a plane in which said given direction extends, for propagating said first light beam along said given direction in a first guided mode corresponding to said linear polarization and in a second guided mode under the influence of said external magnetic field; the distribution of said light beam between said two modes being dependent on the intensity of said external field;
means for coupling said first light beam into said thin film along said given direction;
means for extracting from said thin film a second light beam corresponding to the portion of said first beam propagated in said second guided mode;
means for applying to said thin film a fixed polarization magnetic field parallel to said plane and perpendicular to said given direction;
means for applying to said thin film an AC magnetic field parallel to said given direction and having a given frequency, whereby the intensity of said second light beam is modulated;
means for detecting in said second light beam an AC component having said given frequency and a first variable intensity and delivering a control signal representative of said first variable intensity;
means for applying to said thin film a variable magnetic field

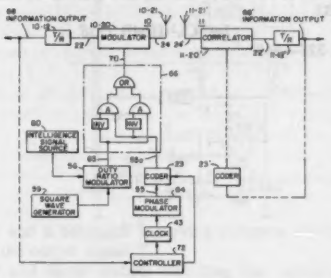
having said given direction, opposed to said external magnetic field, and having a second variable intensity; and means for feedback controlling said second variable intensity under the control of said control signal until said first variable intensity is set to zero said second variable intensity being a measure of the external field.

4,112,368

CONSTANT AMPLITUDE CARRIER COMMUNICATIONS SYSTEM

Walter Ewanus, Ellicott City, Md., and Gerald F. Sage, Grand Rapids, Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 13, 1970, Ser. No. 54,259
Int. Cl.[2] H04K 1/00
U.S. Cl. 325—32 **10 Claims**



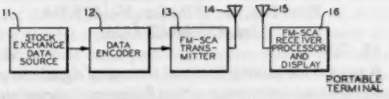
1. In a signalling system, means for generating a carrier wave, means for generating square wave pulses, means for modulating the duty ratio of said square wave unit in accordance with the amplitude of intelligence signals, means for generating code signals, means for modulo-2 adding the output of said duty ratio modulating means with the output of said code generating means, means for phase modulating said carrier and means responsive to the output of said modulo-2 adding means for controlling said phase modulating means.

4,112,369

SECURE SCA BROADCASTING SYSTEM INCLUDING SUBSCRIBER ACTUATED PORTABLE RECEIVING TERMINALS

Aubry S. Forman, Toledo, Ohio; Charles A. Schultz, and John F. Schultz, both of Gainesville, Fla., assignors to Digital Data, Inc., Toledo, Ohio

Filed Apr. 9, 1976, Ser. No. 675,504
Int. Cl.[2] H04K 1/00
U.S. Cl. 325—34 **8 Claims**



1. An information broadcasting system including a transmitting station for encoding and transmitting in serial form data received from an information source by modulating a carrier wave with the encoded data and at least one portable terminal for receiving and decoding the encoded data, said portable terminal comprising:

receiver means for receiving and demodulating the encoded data from the carrier wave;

receiver interface means connected to said receiver means for converting the encoded data from serial to parallel form;

programmed processing means connected to said receiver interface means for reading the encoded data in parallel form, decoding the encoded data in response to a password, and selecting a portion of the decoded data and performing arithmetic and logic operations on the selected data in response to a request for information to be displayed to generate output data in parallel form representing the selected data;

keyboard means for entering said password and said request for information;

display means for displaying said output data; and

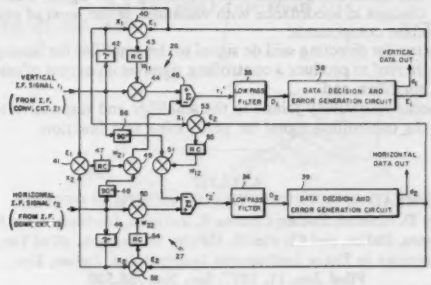
bus means connecting said keyboard means and said display means to said processing means.

4,112,370

DIGITAL COMMUNICATIONS RECEIVER FOR DUAL INPUT SIGNAL

Peter Monsen, Stow, Mass., assignor to Signatron, Inc., Lexington, Mass.

Filed Aug. 6, 1976, Ser. No. 712,147
Int. Cl.[2] H04B 1/12
U.S. Cl. 325—40 **13 Claims**



1. A dual channel receiver system for processing first and second digital data signals having, when transmitted, first and second polarizations, respectively, said receiver comprising:

first and second receiver channels for receiving said first and second digital data signals, respectively, said first signal having, when received, a principal signal component corresponding to said first polarization and at least one error signal component corresponding to said second polarization and said second signal having a principal signal component corresponding to said second polarization and at least one error signal component corresponding to said first polarization;

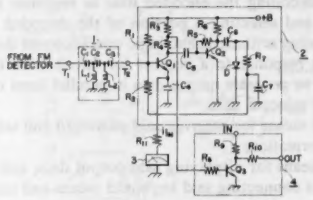
first and second adaptive filter equalization means in said first and second receiver channels, respectively, responsive to said received first and second signals and to error control signals for providing a plurality of weighting signals and for selectively combining said weighting signals with said first and second signals to produce receiver output signals in each of said receiver channels having reduced error signal components; and

first and second error signal generating means responsive to the receiver output signals and to desired data out signals in said first and second receiver channels, respectively, for providing said error control signals to control the weighting signals in said adaptive filter equalization means.

4,112,371
MUTING AND TUNING INDICATOR SYSTEM FOR AN FM RECEIVER

Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 31, 1976, Ser. No. 719,150
Claims priority, application Japan, Sep. 3, 1975, 50/106057
Int. Cl.[2] H04B *1/10, 1/16*
U.S. Cl. 325—319 10 Claims

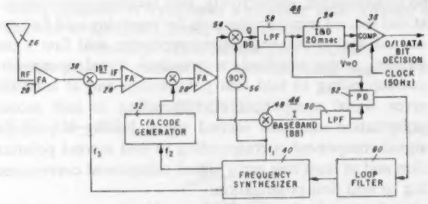


1. A system adapted for use in a tuned FM receiver in order to control at least one of the functions of muting audio output from the receiver and providing an indication of the state of tuning of the receiver, said system comprising:
means for demodulating a received signal;
means for extracting noise components from the demodulated signal;
an automatic gain control amplifier joined to said extracting means for receiving and amplifying the noise components;
a rectifier connected to said amplifier for rectifying amplified noise components and delivering a dc signal which changes in accordance with variations in the level of said noise components;
means for directing said dc signal to the amplifier for biasing thereof to produce a controlling signal at an output of said amplifier; and
means operatively joined to the amplifier and responsive to the controlling signal for performing said function.

4,112,372
SPREAD SPECTRUM COMMUNICATION SYSTEM

Jerry D. Holmes, Dallas; Charles R. Johnson, Garland; Allen S. Jones, Dallas, and Charles R. Hewes, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 11, 1977, Ser. No. 758,520
Int. Cl.[2] H04L *1/00*
U.S. Cl. 325—321 11 Claims

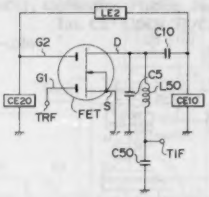


1. A spread spectrum RF energy receiver comprising:
(a) an RF energy receiving means for receiving an RF signal modulated with a first and second code;
(b) a first mixer means connected to the RF energy receiving means and local oscillator frequency generating means for converting the received RF energy signal to baseband;
(c) a code acquisition and synchronizing circuit connected to the first mixer means, the code acquisition and synchronizing circuit including a charge transfer device matched filter for determining the presence of a preselected second code in the received RF energy signal and producing a synchronization pulse;
(d) a frequency generating means for producing responsively to the synchronization pulse of the code acquisition and synchronizing circuit a replica of the preselected second code;
(e) a second mixer means connected to the frequency generating means and first mixer means for converting the baseband signal to the first code signal;
(f) a frequency drift compensating circuit connected to the second mixer for producing a phase difference signal applied to the frequency generating means for automatic frequency and/or phase control; and
(g) means operatively connected to the receiver for converting the first code signal to a binary code.

4,112,373
SELF-EXCITED MIXER CIRCUIT USING FIELD EFFECT TRANSISTOR

Hiroshi Miyamoto, and Mitsuhisa Shinagawa, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 14, 1977, Ser. No. 759,412
Claims priority, application Japan, Jan. 19, 1976, 51-4103; Jan. 19, 1976, 51-4104; Jan. 19, 1976, 51-4105; Dec. 1, 1976, 51-143332
Int. Cl.[2] H04B *1/28*
U.S. Cl. 325—440 21 Claims



1. A self-excited mixer circuit comprising a dual gate field effect transistor having a source, a drain, a first gate and a second gate, said field effect transistor being grounded at said source, a capacitor connected at one terminal thereof to the drain of said field effect transistor, a first capacitive impedance element connected across the other terminal of said capacitor and ground, an inductive impedance element connected across the other terminal of said capacitor and the second gate of said field effect transistor, said capacitive impedance element and said inductive impedance element constituting an oscillation circuit across the drain and the second gate of said field effect transistor, means for applying a radio frequency signal to the first gate of said field effect transistor, and means for deriving the resultant signal of a predetermined intermediate frequency from the drain of said field effect transistor, wherein circuit constants of said impedance elements are provided so as to be able to derive said predetermined intermediate frequency from the drain upon receiving said radio frequency signal at the first gate of said field effect transistor.

4,112,374
DOUBLY BALANCED MIXER WITH OPTIMIZED DYNAMIC RANGE

Donald H. Steinbrecher, Carlisle, Mass., assignor to Steinbrecher Corporation, Woburn, Mass.

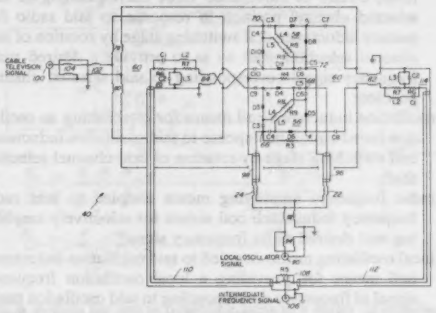
Filed Sep. 23, 1976, Ser. No. 725,714
Int. Cl.[2] H04B *1/26*
U.S. Cl. 325—446 18 Claims

1. A circuit for mixing first and second *rf* signals to produce an output signal containing a beat frequency comprising:
(a) a pair of switches, each having a balun for balancing and removing common mode signals from the first *rf* signal, a diode bridge receiving the balanced first *rf* signal at a control port for controlling the conductive state of the diodes to provide alternating high and low impedance

levels at a switch port, the switch port of the bridges providing opposite impedance levels during each half cycle of the first *rf* signal, and means for providing matched termination of the first *rf* signal irrespective of the conductive state of the switch;

(b) said means for providing matched termination including a terminating resistor and a characteristic impedance of a transmission line which are equal to the peak reverse bias voltage of the diodes divided by the peak forward bias current of the diode to provide optimum dynamic range for the circuit; and

(c) a hybrid receiving the second *rf* signal at an input port and having summing and difference ports coupled to the switch port of the bridges to produce the beat frequency at an output port, the hybrid having a balun for balancing and removing common mode signals from the second *rf*



signal and a balun for removing common mode signals from the output signal;

each of said diode bridges including four interconnected branches each having at least one diode and wherein one pair of opposed junctions of the branches defines the control port and another pair of opposed junctions of the branches defines the switch port, the diodes being coupled in the same conduction sense with respect to the junctions defining the control port, and wherein the means providing matched termination includes first and second resistors each being coupled between a control port junction of one bridge to a control port junction of the other bridge, the diode bridges and the resistors defining a single bridge in which each of one pair of opposed branches contains one of the diode bridges and in which each of the other pair of opposed branches contains one of the first and second resistors.

4,112,375

TUNABLE SELECTIVE SUPER HETERODYNE RECEIVER

Johannes Schittko, Krailling, and Konrad Rauchenecker, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

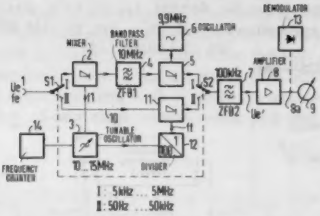
Filed Feb. 25, 1977, Ser. No. 771,966

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1976, 2612720

Int. Cl.[2] H04B *1/32*

U.S. Cl. 325—452 **6 Claims**

1. A receiver comprising an input terminal, a first switch, a first mixer connectible by said first switch to said input terminal, a first tunable injection oscillator supplying an input to said first mixer, a first band pass filter connected to the output of said first mixer, a second injection oscillator, a second mixer receiving inputs from said first band pass filter and said second injection oscillator, a second switch, a second band pass filter connectible by said second switch to the output of said second mixer, signal measuring means connected to the output of said second band pass filter, a third mixer connectible by said first switch to receive an input from said input terminal and its output connectible by said second switch to supply its output to said second band pass filter, and a divider supplying an input to said third mixer and receiving an input from said first tun-



able injection oscillator and wherein the dividing factor of said divider is equal to the center frequency of said first band pass filter divided by the center frequency of said second band pass filter.

4,112,376

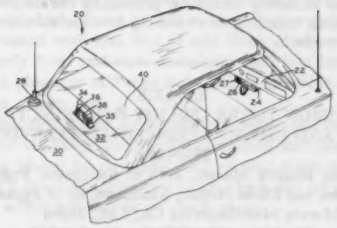
RADIO CHANNEL DISPLAY AND METHOD OF DISPLAY

Robert D. Fosnough, and Max A. Nelson, both of Logansport, Ind., assignors to Controls, Inc., Logansport, Ind.

Filed Sep. 30, 1976, Ser. No. 728,272

Int. Cl.[2] H03J *1/04*; H04B *1/16*

U.S. Cl. 325—455 **6 Claims**



6. A digital readout device for use in a motor vehicle for indicating CB radio channel selection comprising:

first means manually adjustable by the radio operator for visually indicating a selected one of a plurality of channels to the vehicle operator;

second means for visually and digitally indicating said selected channel to persons exteriorly of the vehicle;

third means for electrically coupling said first means to said second means to vary the digital indication on said second means concurrently with and corresponding to the manual adjustment of said first means;

said first means comprises a channel-shaped switch housing having a base and two generally parallel sides extending laterally from said base and having opposing faces; said opposing faces on said sides each having an elongate groove formed therein; said grooves being generally parallel and opposed; each of said grooves having a bed and generally laterally extending parallel walls; each of said beds being slanted relative to their respective groove walls; a switch plate being mounted in said housing transversely of said sides and having opposite edges extending respectively into said grooves; said plate edges being in cammed relation to the respective slanted beds against their respective groove walls to securely hold said plate in said housing.

4,112,377

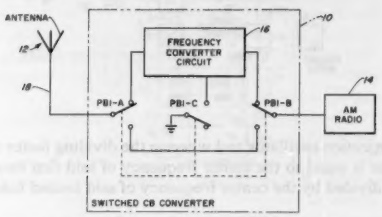
C. B. CONVERTER

James L. Tanner, Reseda, and Bruno A. Rist, Northridge, both of Calif., assignors to Tanner Electronic Systems Technology, Van Nuys, Calif.

Continuation of Ser. No. 648,836, Jan. 14, 1976, abandoned. This application Nov. 15, 1976, Ser. No. 741,659

Int. Cl.[2] H04B 1/18

U.S. Cl. 325—461 **6 Claims**



6. A system for affording the capability of citizens band broadcast to a standard radio comprising:

dual-gate field effect transistor means connected as self-oscillating converter means for converting citizens band transmissions to the AM frequency band;

coupling means coupled to the output of said dual-gate field effect transistor means and connectable to the antenna line of said radio; and

switch means for switching said radio from standard broadcast to citizens band broadcast, said coupling means being connectable to the input of the antenna line of said radio in response to switching by said switch means, said switch means including means for grounding the output of said coupling means upon switching into the standard broadcast mode.

4,112,378

TELEVISION TUNER CIRCUIT FOR SELECTION OF VHF AND UHF/VHF CONVERTED TELEVISION SIGNALS

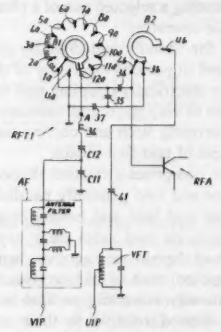
Katsuo Ito; Bunjiro Murata, both of Kanazawa; Yoji Maeda, Ishikawa, and Eiichi Hibino, Kanazawa, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 22, 1977, Ser. No. 780,112

Claims priority, application Japan, Dec. 25, 1976, 51-156695

Int. Cl.[2] H04B 1/06

U.S. Cl. 325—464 **14 Claims**



1. A VHF television tuner circuit for selection of VHF television channels and a UHF/VHF converted television channel through mechanical selection of induction coils, comprising:

first receiving means for receiving a VHF television signal, said VHF television signal comprising a high band channel VHF television signal and a low band channel VHF television signal;

second receiving means for receiving a UHF/VHF converted channel television signal;

mechanical switching channel selection means including a rotatably mounted channel selection shaft for selecting one of a plurality of channel positions by rotation of said channel selection shaft, said channel positions including at least high band channel positions, low band channel positions and a UHF/VHF converted channel position, said mechanical switching channel selection means comprising a radio frequency inductance coil switching stage and an oscillation inductance coil switching stage;

radio frequency inductance coil means comprising a plurality of induction coils for establishing a radio frequency tuned circuit of inductance value corresponding to said selected channel position in response to said radio frequency inductance coil switching stage by rotation of said channel selection shaft so as to provide a desired radio frequency signal corresponding to said selected channel position;

oscillation inductance coil means for establishing an oscillation tuned circuit in response to said oscillation inductance coil switching stage by rotation of said channel selection shaft;

radio frequency amplifying means coupled to said radio frequency inductance coil means for selectively amplifying said desired radio frequency signal;

local oscillating means coupled to said oscillation inductance coil means for providing a local oscillation frequency signal of frequency corresponding to said oscillation tuned circuit and which is different, by a given frequency difference, from the frequency of said selectively amplified desired radio frequency signal;

mixing means responsive to said selectively amplified desired radio frequency signal from said radio frequency amplifying means and said local oscillation frequency signal from said local oscillating means for providing an intermediate frequency signal;

said first receiving means, said radio frequency inductance coil means, and said radio frequency amplifying means being connected in sequence to define a transmission path for said VHF television signal, and said second receiving means and said radio frequency amplifying means being connected in sequence to define a transmission path for said UHF/VHF converted television signal;

said radio frequency inductance coil switching range comprising only a first stage radio frequency switch and a second stage radio frequency switch, said first receiving means being connected to said first stage radio frequency switch and said second receiving means being connected to said second stage radio frequency switch;

said first stage radio frequency switch comprising disabling means responsive to selection of said UHF/VHF converted channel position for disabling the transmission path for said VHF television signal, and means associated with said high and low band channel positions for selecting said induction coils corresponding to said selected channel position for connecting the same to said second stage radio frequency switch;

capacitor means coupled to said radio frequency inductance coil means for establishing, with said selected induction coils, a resonance circuit corresponding to and selecting said desired radio frequency, said capacitor means comprising a first capacitor and a second capacitor;

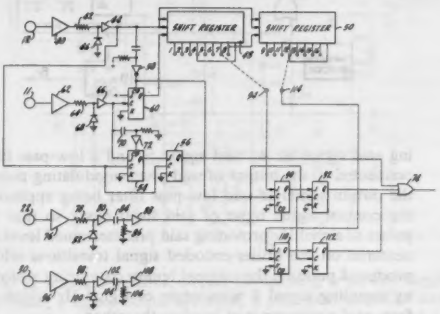
said second stage radio frequency switch comprising selective connecting means responsive to selection of said UHF/VHF converted channel position for selectively connecting said second receiving means to said radio frequency amplifying means, additional connecting means responsive to selection of said high band channel positions for connecting said first and second capacitors in said

resonance circuit in a parallel fashion, and further connecting means responsive to selection of said low band channel positions for connecting said first capacitor in said resonance circuit and for connecting said second capacitor between said resonance circuit and said radio frequency amplifying means.

4,112,379
JAM DETECTOR

Stephen R. Schmidt, Chicago, Ill., assignor to Copar Corporation, Oak Lawn, Ill.

Filed May 23, 1977, Ser. No. 799,217
Int. Cl.[2] B65H 7/04
U.S. Cl. 328—5 **10 Claims**



1. A system for use in detecting jams in a series of members which are sequentially moving through predetermined spaced fixed stations, there being an operation performed on said members in at least one of said stations, said system including detection means at each station providing an output signal indicating the presence of a member at the station, a first circuit means having an input connected to the detection means at one of said stations and a reset input connected to the detection means at another of said stations, a second circuit means having an input connected to the detection means at said one of said stations and an output providing a signal indicating a jam condition,

said first circuit means having an output connected to an input of said second circuit means, with simultaneous inputs at said second circuit means causing an output indicative of a jam condition;

the improvement comprising means for indicating the absence of a member at said one of said stations, and means responsive to said means for indicating the absence of a member for preventing a false jam indication.

4,112,380
CLOCK SEQUENCING APPARATUS HAVING MORE STATES THAN CLOCK PHASE OUTPUTS

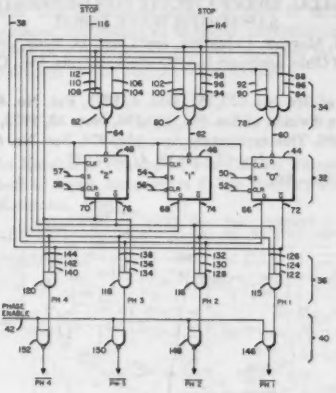
Steve Douglas Thatcher, Roseville, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jul. 19, 1976, Ser. No. 706,663
Int. Cl.[2] H03K 3/04, 1/17, 17/26
U.S. Cl. 328—62 **8 Claims**

2. In a clock sequencing apparatus consisting of a multi-state digital sequential circuit having a stop signal as an input, having an output consisting of a sequence containing a predetermined number of clock phases in a fixed time relationship, and having a separate state for each clock phase and means for sequencing through each state from a first state to a last state in a predetermined order and returning to said first state for continuous operation, the improvement comprising the addition of at least one additional state which has no associated clock phase to said multi-state digital sequential circuit and for passage through said additional state between said last state and said first state if said stop signal is active.

8. A clock sequencing apparatus for producing an output of a plurality of clock phases in a predetermined order and having a stop signal as an input, comprising:

(a) a multi-state digital sequential circuit having a separate state for each of said clock phases including a direct correspondence between each clock phase and each said separate state and at least one additional state, said multi-state digital sequential circuit sequencing from said state associated with a first of said clock phases through said state associated with a last of said clock phases in said predetermined order and then back to said state associated with said first of said clock phases unless said stop signal is



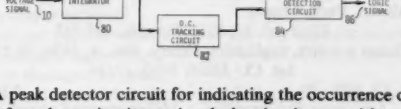
active in which case said multi-state digital sequential circuit sequences from said state associated with said last of said clock phases to said additional state to said state associated with said first of said clock phases instead of directly from said state associated with said last of said clock phases to said state associated with said first of said clock phases; and

(b) a decoding means, selectively coupled to said multi-state digital sequential circuit, for producing said plurality of clock phases by decoding each of said states associated with a clock phase as that clock phase and by decoding said additional state as no clock phase.

4,112,381
PEAK DETECTOR

Alan Craig Mortensen, and Scott A. DeHart, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 607,726, Aug. 25, 1975, abandoned.
This application May 9, 1977, Ser. No. 794,862
Int. Cl.[2] H03K 5/153
U.S. Cl. 328—150 **2 Claims**



1. A peak detector circuit for indicating the occurrence of a peak of an alternating input signal, the circuit comprising:

an integrator for receiving the alternating input signal and for providing an alternating integrated signal having a phase shift of 90° with respect to said alternating input signal;

D.C. tracking means coupled to said integrator for receiving the alternating integrated signal, for sampling every consecutive pair of peaks of said alternating integrated signal, and for providing a reference level signal that is propor-

tional to the mean value of the algebraic sum of the most recently sampled pair of peaks of said alternating integrated signal; and

zero-crossing detection means coupled to said integrator and said D.C. tracking means for receiving said alternating integrated signal and said reference level signal, and for issuing a logic signal at each point in time wherein said reference level signal and said alternating integrated signal are in a predetermined voltage relationship that establishes a selected level of hysteresis.

4,112,382

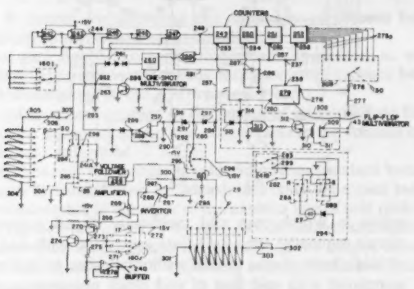
DIGITAL SWEEP CIRCUIT FOR GENERATING SAWTOOTH WAVE FORM

Robert S. Morrow, Columbus, and Lloyd D. Penn, Johnstown, both of Ohio, assignors to IRD Mechanalysis, Inc., Columbus, Ohio

Division of Ser. No. 637,751, Dec. 4, 1975, Pat. No. 4,044,310, which is a division of Ser. No. 420,594, Nov. 30, 1973, Pat. No. 3,938,394. This application Apr. 15, 1976, Ser. No. 677,143

Int. Cl.[2] H03K *4/10, 4/02*

U.S. Cl. 328—181 **7 Claims**



1. A digital sweep circuit adapted to generate an electrical output signal having multiple cycles at each of uniformly increasing frequencies comprising:

clock means for generating uniformly spaced constant voltage signals;

a constant current conductor connecting said clock means to a first capacitor for charging the said first capacitor with a uniform charge increment with each clock signal;

output signal generating means adapted to generate a repeating output signal corresponding in frequency to an applied voltage;

conductor means connecting the said first capacitor to said output signal generating means for delivering the voltage of said first capacitor as the applied voltage for the said output signal generating means.

4,112,383

MILLER-ENCODED MESSAGE DECODER

Albert Burgert, Arcueil, France, assignor to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jul. 27, 1977, Ser. No. 819,383

Claims priority, application France, Aug. 4, 1976, 76 23808

Int. Cl.[2] H03K *9/10, 13/24*

U.S. Cl. 329—50 **4 Claims**

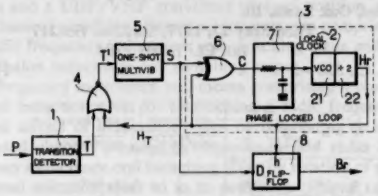
1. Apparatus for decoding a Miller-encoded signal in the form of binary data at a clock frequency F, which comprises:

a transition detector, receiving said Miller-encoded signal, for detecting the transitions in said signal;

a phase controllable local clock, having a control signal input, for generating a clock signal Hr at the rate F, said clock signal comprising a train of bidirectional pulses providing first and second levels each of duration 1/2F;

means, connected to the output of said transition detector and to the output of said clock circuit, for generating a pulse I of duration 1/2F subsequent to each transition in the signal to be decoded when clock signal Hr is at a predetermined one of said first and second levels, said pulses I constituting an output signal S,

means for generating a control signal for said local clock from said clock signal Hr and said signal S, said local clock control signal generating means comprising means, connected to the output of said pulse-generating means and to the output of said clock circuit, for phase modulat-



ing said signal Hr by said signal S, and a low-pass filter connected to the output of said phase modulating means, the output signal of said low-pass filter being applied to the control signal input of said local clock so that the pulses of signal Hr providing said predetermined level are centered on the Miller-encoded signal transitions which produced pulses I, the original binary data being restored by sampling signal S with edges of signal Hr which go from said predetermined level to the other.

4,112,384

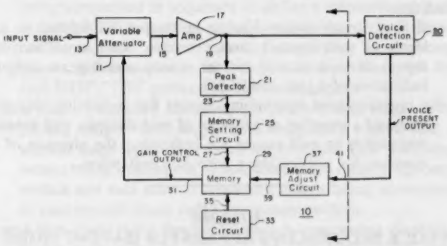
CONTROLLED RECOVERY AUTOMATIC GAIN CONTROL AMPLIFIER

Gregory D. Buchberger, Mount Prospect, Ill., assignor to Morgan Industries, Chicago, Ill.

Filed May 24, 1977, Ser. No. 800,003

Int. Cl.[2] H03G *3/20*

U.S. Cl. 330—141 **27 Claims**



1. An automatic gain control amplifier comprising:

controllable means for accepting an input signal and for amplifying said input signal to produce an amplified output signal, said controllable means having a controllable gain;

detection means responsive to said amplified output signal for producing a memory setting signal when said amplified output signal exceeds a predetermined threshold level;

control means responsive to information derived from said amplified output for producing a memory control signal; and

memory means responsive to said memory setting signal and said memory control signal for producing a gain control signal which varies as a function of both said memory setting signal and said memory control signal, said gain control signal cooperating with said amplifying means to

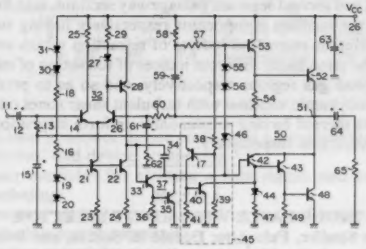
decrease the gain of said amplifying means in response to said memory setting signal and to increase the gain of said amplifying means in response to said memory control signal.

4,112,385

SOUND AMPLIFIER CIRCUIT

Jiro Kusumi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1977, Ser. No. 785,030
Claims priority, application Japan, Apr. 9, 1976, 51-44197[U]
Int. Cl.² H03F 3/26
U.S. Cl. 330—262 **2 Claims**



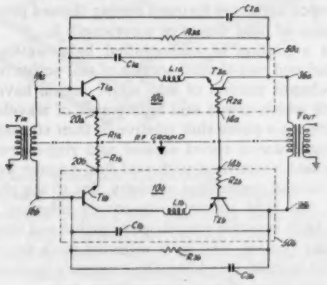
1. A sound amplifier circuit comprising a power supply terminal; a signal output terminal; a push-pull amplifier comprising an upper side power transistor circuit connected between the power supply terminal and the output terminal to amplify the upper side portion of an amplitude of an input signal, a reference potential source and a lower side power transistor circuit connected between the reference potential source and the signal output terminal to amplify the lower side portion of an amplitude of the input signal; an input signal terminal; an input decoupling capacitor coupled to the input signal terminal; a detection circuit parallely connected across the input decoupling capacitor to detect a discharge of the input decoupling capacitor; and means for causing the lower side power transistor circuit to be disabled by an output of the detection circuit.

4,112,386

MODULAR RADIO FREQUENCY AMPLIFIER HAVING A GAIN VARIABLE BY EXTERNAL PASSIVE COMPONENT SELECTION

Norman Everhart, Richboro, and Dieter Bruno Brauer, Hatboro, both of Pa., assignors to Jerrold Electronics Corp., Hatboro, Pa.

Filed Feb. 14, 1977, Ser. No. 768,415
Int. Cl.² H03F 3/26
U.S. Cl. 330—265 **7 Claims**



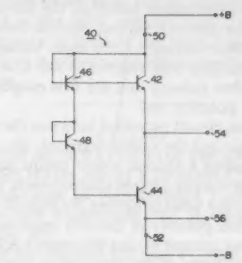
1. In combination in a radio frequency amplifier, first and second cascode amplifier stages each having an input and output port connected in push-pull arrangement; each of said first and second cascode amplifier stages included a first transistor connected in a grounded emitter mode and a second transistor connected in a grounded base mode, the collector of said first transistor in each of said first and second cascode amplifier stages being connected to the emitter of said second transistor therein included; each of said first and second cascode amplifier stages including first inductance means serially connected between the collector of said first transistor and the emitter of said second transistor further comprising a hybrid circuit substrate upon which are mounted said first and second transistors of each of said first and second cascode amplifier stages, said first inductance means in each of said cascode amplifier stages comprising an irregular, supertine conduction path formed of a conducting material mounted on said substrate connected to said transistor electrodes.

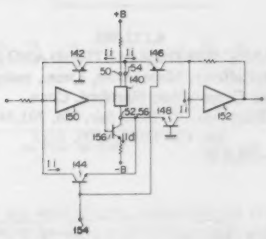
4,112,387

BIAS CIRCUIT

Masayuki Katakura, Yokohama, and Hisashi Yamada, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 14, 1977, Ser. No. 768,560
Int. Cl.² H03G 3/30
U.S. Cl. 330—285 **8 Claims**





1. A voltage controlled variable gain circuit comprising
an input terminal;
first and second control terminals;
an output terminal;
first and second voltage sources having opposite polarities;
an amplification circuit, the input side of which is connected to the input terminal;
first and second transistors of a first conductivity type cascade-connected between the first and second voltage sources, the collector and the base of the first transistor being connected to the first voltage source, the emitter of the first transistor being connected to the collector of the second transistor, the emitter of the second transistor being connected to the second voltage source, and the emitter of the second transistor being connected to the output sides of the amplification circuit;
first and second diode means series-connected between both

bases of the first and second transistors and forward-biased by part of a drive current toward the first and second transistors;

a first feedback circuit provided between the input side of the amplification circuit and the emitter of the second transistor, the first feedback circuit including a third transistor of the first conductivity type, the collector, emitter and base of which are connected to the input side of the amplification circuit, the emitter of the second transistor and the first control terminal, respectively, and the third transistor having a first input voltage-output current characteristic with respect to a first input voltage having a first polarity and a first output current having a first polarity;

a second feedback circuit provided between the input side of the amplification circuit and the emitter of the first transistor, the second feedback circuit including a first active means having a second input voltage-output current characteristic with respect to a second input voltage having a second polarity opposite to the first polarity of the first input voltage and a second output current having a second polarity opposite to the first polarity of the first output current, and the second input voltage-output current characteristic being symmetrical to the first input voltage-output current characteristic;

a first output circuit provided between the emitter of the second transistor and the output terminal, the first output circuit including a fourth transistor of the first conductivity type, the collector, emitter and base of which are connected to the output terminal, the emitter of the second transistor and the second control terminal, and the fourth transistor having a third input voltage-output current characteristic with respect to the first input voltage having the first polarity and the first output current having the first polarity; and

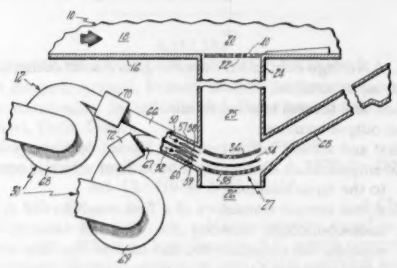
a second output circuit provided between the emitter of the first transistor and the output terminal, the second output circuit including a second active means having a fourth input voltage-output current characteristic with respect to the second input voltage having the second polarity opposite to the first polarity of the first input voltage and the second output current having the second polarity opposite to the first polarity of the first output current, and third characteristic being symmetrical to the fourth characteristic.

4,112,388

AERODYNAMIC WINDOW METHOD AND APPARATUS

George H. McLafferty, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 30, 1976, Ser. No. 701,347
Int. Cl.[2] H01S *3/05, 3/22*
U.S. Cl. 331—94.5 D **6 Claims**



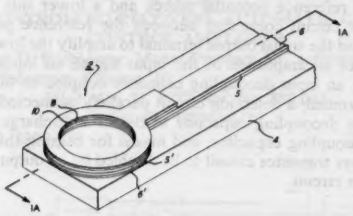
5. In an aerodynamic window system for producing an aerodynamic window between the first and second separate gas regions with substantially different static pressures and indices of refraction and comprising first conduit means for connecting the separate gas regions and providing an unobstructed optical beam transmission passageway therebetween, and aerodynamic window producing means having second conduit means intersecting the first conduit means and operable for discharging a high velocity gas medium across the optical beam transmission passageway to produce an aerodynamic window for preventing substantial gas flow through the passageway between said gas regions, the improvement wherein the second conduit means provides first and second separate passageways upstream of the aerodynamic window for discharging first and second different aerodynamic window gas medium components respectively at high velocity across the optical beam transmission passageway and at opposite sides of the aerodynamic window adjacent to said first and second gas regions respectively, and wherein the aerodynamic window producing means provides for discharging through the first and second separate passageway sections, said first and second gas medium components respectively having substantially different stagnation indices of refraction which are generally the same as the different indices of refraction of said first and second gas regions respectively, and so as to produce a said aerodynamic window with turbulent shear zones on opposite sides thereof having substantially uniform stagnation indices of refraction respectively.

4,112,389

DIODE LASER WITH RING REFLECTOR

William Streifer, Palo Alto; Donald R. Scifres, and Robert D. Burnham, both of Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1977, Ser. No. 761,110
Int. Cl.[2] H01S *3/19*
U.S. Cl. 331—94.5 H **4 Claims**



1. A semiconductor device including:

a laser portion and a waveguide portion, supported by a substrate,

said laser portion comprising a plurality of semiconductor layers including a laser active region having a ring-shaped portion and a first coupler portion connected to said ring-shaped portion,

a rectifying junction between two of said semiconductor layers within said laser portion, means for forward biasing said rectifying junction, carriers injected across said junction upon sufficient forward biasing thereof providing the emission of light waves of wavelength λ,

at least a portion of said emitted light waves traveling around said ring-shaped portion of said active region, said ring-shaped portion of said active region having a path length which causes said light waves of wavelength λ to experience a phase shift relative to their starting phase as the light waves travel around said ring-shaped portion from said connection with said first coupler portion and back to said connection whereby, due to the phase difference, the light waves destructively interfere to reflect light back into said ring-shaped portion and into said first coupler portion, and light reflected back into said ring-shaped portion providing the necessary feedback to provide for lasing of said laser portion, and

said first coupler portion being coupled to said waveguide portion whereby at least some of the light waves reflected

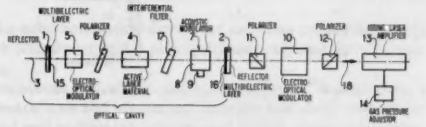
into said first coupler portion propagate into said waveguide portion.

4,112,390

LASER GENERATOR DEVICE EMITTING AT A WAVELENGTH CLOSE TO 1.3 MICRONS

Jean-Claude Farcy, Briis sur Forges, France, assignor to Compagnie Generale d'Electricite S.A., Paris, France

Filed Nov. 4, 1976, Ser. No. 738,993
Claims priority, application France, Nov. 17, 1975, 75 34994
Int. Cl.[2] H01S *3/10, 3/23, 3/16, 3/22*
U.S. Cl. 331—94.5 G **17 Claims**



1. A laser generator device emitting at a wavelength close to 1.3 microns, said device comprising:

a laser oscillator for emitting a light signal, said oscillator including:

a resonant optical cavity formed by two reflectors, one of which is semi-transparent;

an active material;

means for exciting said active material;

means for triggering at least one light pulse in said cavity containing the excited active material; and

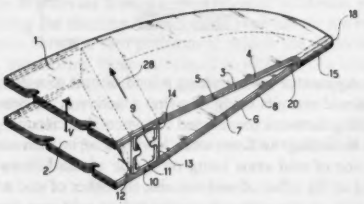
at least one amplifier disposed at the output of said oscillator, said amplifier comprising an active gas constituted by an iodine compound and means for exciting said active gas; and wherein the active material of said oscillator is an active material doped with neodymium and has selective means for allowing the passing in said amplifier of the radiation of said signal situated in a wavelength range covering the emission lines of the neodymium close to 1.3 microns and the various emission lines of said active gas, said wavelength range excluding the neodymium emission lines close to 1.06 and 0.9 microns.

4,112,391

GAS LASER GENERATOR

Bruno Godard, Gif-sur-Yvette, France, assignor to Compagnie Generale d'Electricite S.A., Paris, France

Filed Aug. 12, 1976, Ser. No. 713,946
Claims priority, application France, Aug. 21, 1975, 75 25897
Int. Cl.[2] H01S *3/00*
U.S. Cl. 331—94.5 PE **7 Claims**



1. A gas laser generator comprising:

superimposed plates in the following order:

a first metallic plate, a first insulating plate and a second metallic plate, these plates forming a first excitation line;

a third metallic plate, a second insulating plate and a fourth metallic plate, these plates forming a second excitation line;

said second metallic plate and said third metallic plate each including respectively a first slot and a second slot separating them into two distinct parts, these first and second slots being arranged adjacent to each other, the second and third metallic plates being separated over at least a part of their surface to provide a gap between the slots;

two electrodes disposed respectively, on either side of the slots, each of said electrodes being connected to the second and third metallic plates along an edge of these slots; and

means disposed in said gap to maintain a gaseous active medium between the electrodes; characterized in that:

the surface of each of the first and second electric lines is limited:

by an arc of a half parabola, said arc not including the apex of said half parabola and being limited by a first point situated near the apex thereof and a second point which is remote from the apex;

by a segment joining together the focus of the half parabola and the first point;

and by a portion of the axis of said half parabola situated in relation to said apex beyond said focus, and wherein each half parabola has the same focal distance, the first and second slots form an angle greater than zero with the axes of said half parabolas, said first and second electric lines being in electrical continuity along said segments, the focusses of the half parabolas being merged at a third point, the first metallic plate being connected to the fourth metallic plate, the first insulating plate being connected to the second insulating plate, the second metallic plate being connected to the third metallic plate; such that when a brief discharge is fired at the third point a progressive current wave is generated simultaneously in the two excitation lines.

4,112,392

METHOD AND APPARATUS FOR PRODUCING LASER PULSES WITH HIGH REPRODUCIBILITY

Hans E. B. Andersson, 14, Napenkroken, Lund, Sweden (S-222 47), and Wladimir Wladimiroff, 43B, St. Olofsgatan, Uppsala, Sweden (S-753 30)

Continuation of Ser. No. 614,215, Sep. 17, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,102
Int. Cl.[2] H01S *3/097*
U.S. Cl. 331—94.5 PE **3 Claims**

1. A pulsed gas laser system comprising an elongated high voltage conductor having a back terminal end and a front end connected with a high voltage electrode, a capillary extending straight forwardly from said electrode axially with respect to said conductor to a front end having a grounded electrode forming a laser beam passage, said capillary being axially aligned with said conductor and containing gas between said electrodes and which gas after a delay period suddenly breaks down under high voltage on said high voltage terminal and produces a laser pulse through said passage, a shielding tube surrounding said conductor and capillary and connected with said grounded electrode and thereby forming a first capacitor, a second capacitor having one side connected with a source of high voltage and shunted by a high voltage switch to ground and a second side connected to the terminal end of said elongated conductor, said first and second capacitors being parts of cooperating interconnected circuits comprising a high voltage pulse-forming network, each circuit having capacitance, resistance and inductance relatively valued with respect to each other so as to produce a high voltage pulse upon actuation of

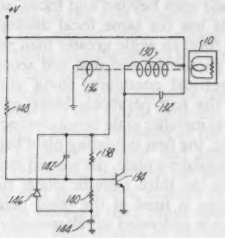
said switch and which pulse rises to a maximum value on said second side of the capacitor, said maximum value being reached simultaneously with the termination of said delay period when said gas suddenly breaks down and produces said laser pulse, repetitive actuation of said switch causing the production of laser pulses with high pulse-to-pulse reproducibility.

4,112,393

AUTOMATICALLY STABILIZED OSCILLATOR

Lindsey E. Waldorf, and Kenneth E. Monroe, both of Ann Arbor, Mich., assignors to Patents Licensing International, Ltd., Southfield, Mich.

Continuation-in-part of Ser. No. 560,396, Mar. 20, 1975, Pat. No. 4,020,310. This application Apr. 25, 1977, Ser. No. 790,436
Int. Cl.[2] H03B *3/02*
U.S. Cl. 331—109 **7 Claims**



1. A generator for applying an oscillatory electromagnetic field to an electrically conductive load to induce currents in said load, comprising: a transistor; a tank circuit connected in the emitter-collector circuit of the transistor, the tank circuit including a capacitor and an inductor adapted to be disposed in operating relationship to said load; a bias circuit consisting of a capacitor and a rectifier connected in the base circuit of the transistor; and a tickler coil supported to experience the electromagnetic field generated by the inductor and connected to the bias circuit, whereby the generator begins oscillation as a class A oscillator and achieves class C oscillation after start-up, and the charge on the bias circuit varies as an inverse function of the tank circuit impedance to maintain a constant average tank circuit current independent of variations in the tank circuit impedance.

4,112,394

METHOD AND MEANS OF LINK COUPLING WITH SEPARATE CONTROL OF LINK REACTANCE AND COUPLING COEFFICIENT

Joseph E. Kershaw, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

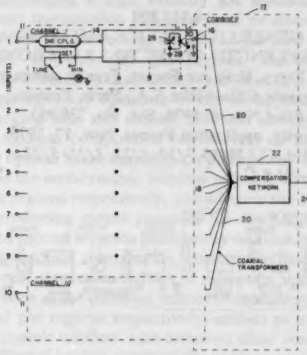
Filed Jan. 3, 1977, Ser. No. 756,575
Int. Cl.[2] H03H *7/46*
U.S. Cl. 333—6 **2 Claims**

1. A multicoupler for coupling in the 30–76 MHz range and at power levels in the 100 watt range comprising:

a plurality of not less than four variable frequency channels, each channel including an input/output terminal and being tunable to a particular band pass within said 30–76 MHz range;

combiner circuit means including a common junction;

each of said channels having a link coupler including an inductor coil from which energy is to be coupled and having a first terminal coupled to said input/output terminal and a second terminal connected to ground, a reactive link of a predetermined reactance having an input terminal and an output terminal positioned for close coupling with said inductor coil and means connecting said reactive link input terminal to said inductor coil at a point above ground to provide the desired coupling coefficient; and



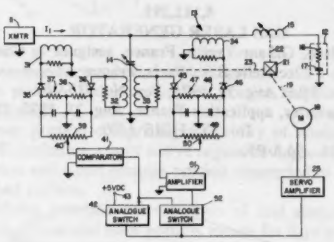
coaxial transformer means connecting the output terminl of said reactive link to said common junction.

4,112,395

METHOD OF AND APPARATUS FOR MATCHING A LOAD CIRCUIT TO A DRIVE CIRCUIT

Glen Seward, Cincinnati, Ohio, assignor to Cincinnati Electronics Corp., Cincinnati, Ohio

Filed Jun. 10, 1977, Ser. No. 805,340
Int. Cl.[2] H03H *7/40*
U.S. Cl. 333—17 M **21 Claims**



10. Apparatus for matching a load circuit to a drive circuit, one of said circuits being of a first reactive type, comprising a matching network connected between the circuits, said network including: an L network having a series arm and a shunt arm, one of said arms being on a side of the L network connected to the other of said circuits, the other of said arms being on a side of the network connected to said one circuit, said other arm including a reactance of a second reactive type, opposite to the first reactive type, said one arm including a further reactance having a value to provide an approximate match between the circuits; means for measuring the amplitude of first and second parameters respectively indicative of: (a) the energy in said one arm, and (b) the energy in said other arm and the one circuit, the two measured parameters being of the same type; and means responsive to the measuring means for adjusting the value of the reactance in the other arm.

4,112,396

ECHO ANNEXATION DEVICE

Chuzo Honda, 2-45, Shiroki-cho, Chikusa-ku, Nagoya-shi, Aichi-ken, Japan (464)

Filed Feb. 2, 1976, Ser. No. 654,715
Claims priority, application Japan, Feb. 17, 1975, 50-20204; May 19, 1975, 50-59415; Jun. 13, 1975, 50-72304
Int. Cl.[2] H03H *9/30;* G10H *1/02;* H03H *9/26*
U.S. Cl. 333—30 R 10 Claims

1. An echo annexation device for use in an apparatus having a drive-transducer and a pickup-transducer, said device comprising:

a continuous helically coiled spring helically wound about a central axis and connected between said drive-transducer and said pickup-transducer, said coiled spring being comprised of a plurality of equal diameter helical first coil segments coaxially aligned with each other and said central axis through said spring; and

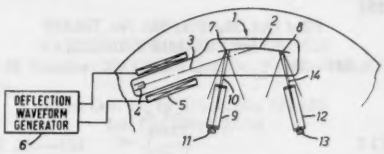
at least one second coil segment between two of said first coil segments, said second coil segment being a helical loop with a diameter greater than the diameter of said first coil segments and wound in the same direction as said first coil segments about said central axis, said helical loop having a tip portion, and said tip portion being bent downwardly at an angle toward said central axis.

4,112,397

X-RAY TUBE ARRANGEMENT

Robert Paul Randall, Uxbridge, England, assignor to EMI Limited, Hayes, England

Filed Jul. 11, 1977, Ser. No. 814,334
Claims priority, application United Kingdom, Aug. 14, 1976, 33903/76
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—401 5 Claims



1. An X-ray tube arrangement including an anode, means for generating an electron beam and directing it to be incident on said anode to generate X-rays at the region of incidence, means for deflecting the electron beam to scan repetitively the region of incidence between two positions at which the deflection is reversed, monitoring means arranged to monitor the intensity of X-rays emitted at two points, on the anode, in the vicinity of each of which a reversal is intended to occur and means for operating on the output of each monitoring means to estimate the variation of the position of the respective reversals from its intended position.

4,112,398

TEMPERATURE COMPENSATED MICROWAVE FILTER

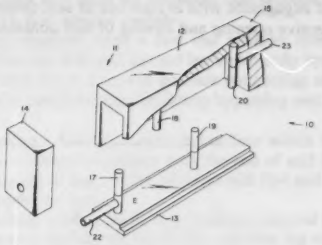
Gary L. Burnett, Anaheim, and George I. Tsuda, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 5, 1976, Ser. No. 712,113
Int. Cl.[2] H01P *7/06, 1/20, 1/30*
U.S. Cl. 333—73 R 7 Claims

1. A lightweight microwave filter having temperature compensation for providing stable resonant frequencies in response to temperature changes, comprising:

a housing being of a lightweight metal alloy having a first coefficient of thermal expansion; and

a fixed resonator rod for providing a resonant frequency disposed within said housing, said resonator rod being segmented, a first cylindrically shaped segment being of said lightweight metal alloy, a second cylindrically shaped segment being a metal alloy having a coefficient of thermal expansion being smaller than said first coefficient of



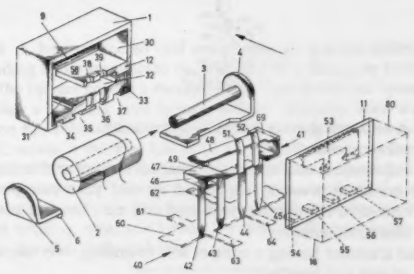
thermal expansion, said first and second segments being axially mounted together, said resonator rod and said housing providing a tuning capacitance therebetween depending upon the variance in relative length of said resonator rod and said housing, the lengths of said first and second segments being determined such that the variation in tuning capacitance between the end of said resonant rod and said housing compensates for the resonant frequency shift due to thermal expansion of said resonator rod so that said resonant frequency remains relatively constant.

4,112,399

MINIATURE RELAY

Ernst Pracher, Oberhaching; Wolfgang Adalbert Schrötter, Unterhaching, and Wolfgang Heider, Lenggries, all of Germany, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Sep. 13, 1976, Ser. No. 723,101
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545180
Int. Cl.[2] H01H *67/00*
U.S. Cl. 335—106 12 Claims



1. A miniature relay comprising:

a housing including a base and a lid, said base having a plurality of recesses therein for receiving and supporting electro-mechanical elements for said relay in predetermined positions, said lid closing a side of said housing base and having contours on its inner surface to aid in positioning the electro-mechanical elements in said predetermined positions;

a plurality of connector pins penetrating the bottom of said housing, said connector pins arranged in a row and lying in a common plane;

at least two contacts supported in said housing and connected to respective ones of said connector pins;

a solenoid coil supported in said housing, the axis of said solenoid coil located in said common plane, said coil having a pair of lead wires connected to respective ones of said connector pins, said lid and said base both including shaped portions embracing said solenoid coil; and

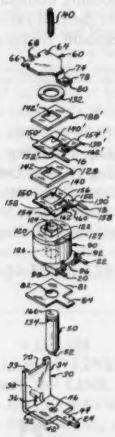
an armature movable by energization of said solenoid coil and engageable with at least one of said contacts to effect selective opening and closing of said contacts.

4,112,400

RELAY FOR PRINTED CIRCUITS

John H. Jaidinger, Marengo, and Mamoru Sakazaki, Chicago, both of Ill., assignors to Jaidinger Mfg. Co., Inc., Chicago, Ill.

Filed May 17, 1977, Ser. No. 797,693
Int. Cl.² H01H *67/02*
U.S. Cl. 335—128 **6 Claims**



1. An electrical relay assembly comprising:

a yoke member;

a coil member and associated axial core member therein;

an armature pivotally supported by said yoke member in operative relationship with said coil member and associated core member;

said armature having a contact arm extending over one side of said coil member;

a pair of flexible contact arm members supported from the axis of said coil member and having their spaced respective contact arms positioned to said side and above and below said contact arm of said armature for makebreak contact therewith; and

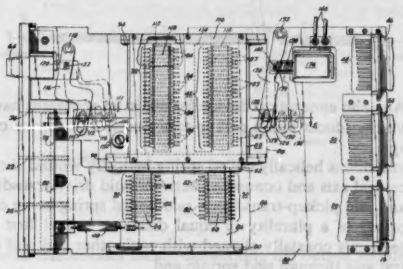
support means between said coil member and said flexible contact arm members holding said arm members in insulated, spaced and non-rotative relationship from the axis of said coil member.

4,112,401

ELECTRICAL SWITCHING APPARATUS AND CONTROL SYSTEM FOR USE THEREWITH

James E. Palmer, Moorestown; Donald C. Lavallee, Haddon Heights, and George Huber, Mt. Laurel, all of N.J., assignors to Spectron Corporation, Mt. Laurel, N.J.

Filed Mar. 14, 1977, Ser. No. 777,117
Int. Cl.² H01H *36/00*
U.S. Cl. 335—206 **19 Claims**



1. Electrical switching apparatus, comprising:

a plurality of magnetically-actuatable switch means;

magnet means positioned adjacent said switch means;

electromechanical means responsive to changes in an electrical quantity for controlling the effect of said magnet means upon said switch means to accomplish actuation of said switch means from a first electrical state thereto to a second electrical state thereof; and

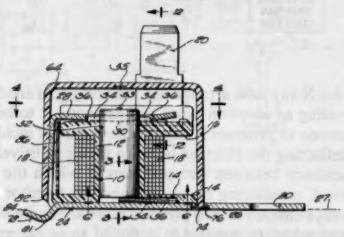
manually-operable mechanical means for also controlling the effect of said magnet means upon said switch means, alternatively to control said actuation of said switch means.

4,112,402

COMPACT FAIL-SAFE BUZZER

Spencer C. Schantz, 16608 W. Rogers Dr., New Berlin, Wis. 53151

Filed Oct. 28, 1976, Ser. No. 736,610
Int. Cl.² H01F *7/16*
U.S. Cl. 335—252 **16 Claims**



1. In an electrical device having an inner member and having a plastic housing which is open at one end and closed at the other end and which covers said inner member and which has flexible sides with slots, the improvement comprising chamfered tabs projecting from said inner member in snap-engagement with the slots in said housing to fasten said housing to said inner member, triangular posts in the corners of said housing, the lower ends of said posts being positioned to act as abutments in cooperation with portions of said inner member to limit movement of said housing relative to said inner member, and a stud projecting from said housing, there being a frame member having an opening receiving said stud, and said open-

ing being counterbored and said stud being staked in said counterbore to aid in securing the housing to the frame.

4,112,403

SATURATED REACTOR ARRANGEMENTS

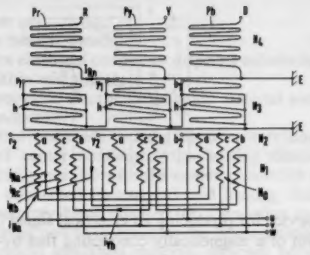
Erich Siegfried Friedlander, Sutton Coldfield, England, assignor to Associated Electrical Industries Limited, London, England

Filed Nov. 22, 1976, Ser. No. 743,790

Claims priority, application United Kingdom, Nov. 25, 1975, 48358/75

Int. Cl.² H01F *33/00*; G05F *3/06*

U.S. Cl. 336—12 **10 Claims**



1. A saturated reactor arrangement for use in a voltage stabilising system, the reactor arrangement comprising a reactor core having nine wound limbs, a symmetrical star-connected primary winding distributed over said nine wound limbs, a set of phase-shifting windings arranged on said nine limbs and interconnected to produce fluxes in the nine limbs of phases uniformly staggered throughout 360°, each arm of said primary star-connected winding embracing three of said nine limbs whose flux phases are such as to provide net cancellation of third harmonic voltages in that arm, and a mesh-connected winding coupling said nine limbs to provide a path for the circulation of ninth harmonic current, and a terminal connection for earthing the star point of said primary winding.

4,112,404

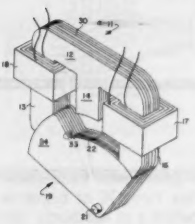
VARIABLE FLUX TRANSFORMER

Homer A. Boushey, 235 Golden Oak Dr., Portola Valley, Calif. 94025

Filed Oct. 12, 1976, Ser. No. 731,133

Int. Cl.² H01F *21/06*

U.S. Cl. 336—133 **2 Claims**



1. A variable flux transformer comprising:

A. a transformer core of a magnetic flux-conductive material having at least three legs extending from a common crossbar, which legs terminate at free ends spaced from one another;

B. a primary electrical coil interactively associated with a first one of said core legs to generate magnetic flux therein, the free end of said first leg terminating at a location beyond the terminus of said second and third legs;

C. a secondary electrical coil interactively associated with a second one of said core legs for the inducement in said coil of an electromotive force in response to a magnetic flux flow change in said second leg; and

D. a rotary magnetic flux path control switch of a magnetic flux-conductive material mounted adjacent said free ends of said legs for continuously variable rotary positioning relative to the ends of said legs selectively bridging the spacing therebetween to complete essentially an infinite number of differing low reluctance paths for flow of magnetic flux generated in said first leg through said second leg interactively by said secondary electrical coil and through said third leg bypassing said secondary electrical coil, said control switch:

(1) being rotatable from a first end position connecting said first leg with said second leg completely bypassing said third leg to a second position connecting said first leg with said third leg completely bypassing said second leg;

(2) including a first leg contacting surface which remains in flux connecting contact with the end of said first leg on rotation of said switch between said first and second end positions; and

(3) including a lobe extension providing a second leg end contacting surface separate from said first leg end contacting surface, which second contacting surface moves between said second and third legs to connect said first leg respectively with said second and third legs upon rotation of said switch from said first to said second end position; and

(4) having an axis of rotation positioned closer to the free end of said first leg than to the free ends of said second and third legs.

4,112,405

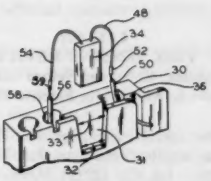
COIL WITH PROTECTION AGAINST OVERHEATING

Mark Joseph, 2400 N. Lake View, Chicago, Ill. 60614

Filed Aug. 16, 1976, Ser. No. 714,342

Int. Cl.² H02K *11/00*

U.S. Cl. 337—4 **7 Claims**



1. A heat protected coil comprising an integral bobbin including a hub terminated on each end by a flange, at least one of the flanges having a recess formed therein with an open side facing a winding area in said bobbin, whereby wire wound upon the bobbin forms a wall of wire closing the open side of said recess, a thermal fuse in an electrically insulated housing pressed into said recess, said insulated housing shaped and configured to fit into said recess with intimate physical contact with the layers of a coil forming said wall of wire wound into said winding area, and means for electrically connecting said fuse in series with said coil.

4,112,406

DUPLEX THERMOSTAT

Colin D. Hickling, Woodstock, N.Y., assignor to American Thermostat Corporation, South Cairo, N.Y.

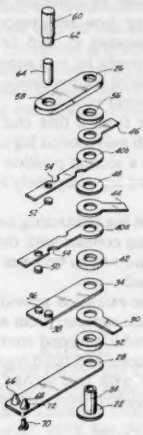
Filed Apr. 4, 1977, Ser. No. 784,555

Int. Cl.² H01H *37/52*

U.S. Cl. 337—338 **10 Claims**

1. A thermostat comprising a support, first and second resilient means mounted in spaced relation on said support, each of

said means having mounted thereon a pair of contacts, each of said contacts on one of said means being aligned with a different contact on the other of said means, a thermally deformable element mounted on said support and spaced from said first means, means operably connecting said element and said first means such that deformation of the former moves the latter



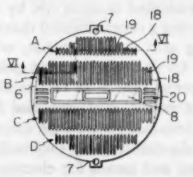
relative to said second means, means for adjustably positioning said second means relative to said first means, said first means being formed of first and second isolated parts upon each of which is mounted one of said contacts, and means for spacing said first and second parts, respectively, different distances from said element.

4,112,407

FIRE SENSING DEVICE

Yasuyoshi Kameyama, Kobe, and Satoru Suzaki, Suita, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 27, 1977, Ser. No. 791,489
Claims priority, application Japan, Jul. 30, 1976, 51-91822
Int. Cl.[2] H01H *37/46*
U.S. Cl. 337—398 **5 Claims**



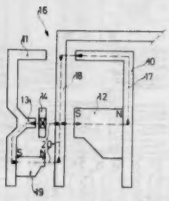
1. A fire sensing device for actuating fire alarm system comprising a base body, a heat-responsive switch mounted to said base body, and a heat receiving plate member thermally connected to said switch and expanding around the switch, said heat receiving plate member being provided therein with at least two groups of slits defined by fins formed by being raised from the plate member, said fins in each of said groups being raised respectively in the same direction, and said raised direction of the fins in each of the groups being different from that in the other groups.

4,112,408

DEVICE FOR PRODUCING AN ELECTRICAL PULSE IN RESPONSE TO PASSAGE OF A MAGNETICALLY CONDUCTING MEMBER THROUGH AN AIR GAP

Herman Roozenbeek, Schwieberdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 21, 1977, Ser. No. 844,352
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647818
Int. Cl.[2] H01L *43/04*
U.S. Cl. 338—32 H **3 Claims**



1. A device for producing an electrical signal in response to movement of a magnetically conducting flux-by-pass member thereof past a stator member thereof that comprises a first permanent magnet and a Hall generator and provides an air gap in the stator structure through which said flux-by-pass member is able to pass and in passing to complete a magnetic circuit for said permanent magnet that excludes said Hall generator, said device having the improvement wherein:

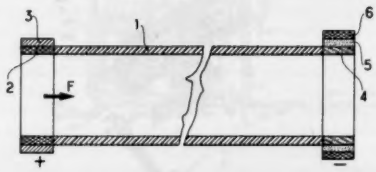
a second magnet (15) is provided and mounted on a portion of said stator in such a configuration that when said flux-by-pass member (18) is in said air gap (16), said second magnet (15) sets up a magnetic flux in said Hall generator (14) in a direction opposite to that of magnetic flux in said Hall generator (14) set up by said first magnet (12) when said air gap (16) is clear of intrusion by said flux-by-pass member.

4,112,409

ELECTROLYTIC RESISTOR

Jean Jacquelin, Marolles en Hurepois, France, assignor to Compagnie Generale d'Electricite S.A., France

Filed Nov. 19, 1976, Ser. No. 743,256
Claims priority, application France, Dec. 3, 1975, 75 36968
Int. Cl.[2] H01C *10/02*
U.S. Cl. 338—222 **15 Claims**



1. An electrolytic resistor of the type containing a flow of an alkaline aqueous solution including a metal in suspension and a hydroxide of said metal in solution, said resistor comprising a tube made of an electrically insulative material for containing said flow, the positive end of said electrolytic resistor comprising a grid made of a conductive material capable of retaining particles of said metal in suspension and the negative end of said resistor comprising an inner porous insulator and hydrophilous separator layer, an intermediate electrode layer capable of consuming oxygen in the air and of producing hydroxide ions therefrom, and an outer conductive grid layer.

4,112,410
HEATER AND METHOD OF MAKING SAME

Ronald M. Wrob, Kirkwood, and Jeffrey P. Melly, St. Louis, both of Mo., assignors to Watlow Electric Manufacturing Company, St. Louis, Mo.

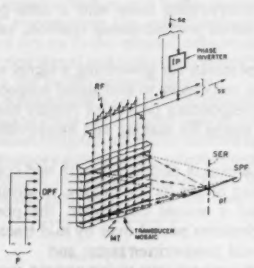
Filed Nov. 26, 1976, Ser. No. 744,961
Int. Cl.[2] H01C *1/028*
U.S. Cl. 338—243 **8 Claims**

1. A heater comprising:
a metallic tubular sheath;
an elongate electrical conductor disposed substantially coaxially within said sheath;
fibrous, inorganic electrical insulation material surrounding said conductor;
an electrical resistance heating element surrounding said insulated center conductor, the heating element being substantially coaxial with the center conductor and electrically connected thereto and said heating element and said conductor being adapted for connection to a source of electrical power to energize the heating element; and
other electrical insulation material disposed between said heating element and said sheath to electrically insulate the heating element from the sheath and provide a conductive heat transfer path between the heating element and the sheath.

4,112,411
DEVICE FOR ECHOGRAPHY BY MEANS OF FOCUSSED ULTRASONIC BEAMS

Pierre Alais, Dampierre, and Michel Joseph Auphan, Paris, both of France, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Dec. 9, 1976, Ser. No. 748,691
Claims priority, application France, Dec. 11, 1975, 75 37929
Int. Cl.[2] G01S *9/66*
U.S. Cl. 340—1 R **14 Claims**

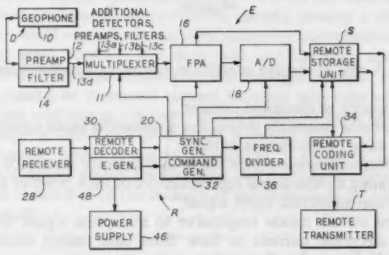


1. A device for echography comprising, a mosaic of ultrasonic transducers arranged in N rows and M columns for transmitting ultrasonic vibrations to a surface to be examined and for receiving and converting ultrasonic vibrations into electrical signals after reflection by said surface, means for operating selected transducers in phase or in phase-opposition in accordance with a predetermined program set out in a focussing diagram so that the ultrasonic vibrations are transmitted and received as focussed beams, the transducers being made of a material which can be brought into one of two characteristic states by applying a prepolarization signal thereto, the phase of an electrical signal corresponding to an ultrasonic wave being dependent upon the state obtained by the transducer by prepolarization, and means for prepolarizing the transducers selected from a group of *n* rows or columns ($n \leqq$ N and M) of transducers according to a predetermined prepolarization diagram so that certain selected rows or columns of transducers are prepolarized in the one state and others are prepolarized in the other state so that the ultrasonic waves transmitted or received by these rows or columns together form a prefocussed beam having a line focus which is situated in a predetermined position.

4,112,412
DIGITAL SEISMIC TELEMETRY SYSTEM

Donald L. Howlett, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 530,913, Dec. 9, 1974, abandoned. This application Dec. 10, 1976, Ser. No. 749,646
Int. Cl.[2] G01V *1/00*
U.S. Cl. 340—15.5 TS **5 Claims**

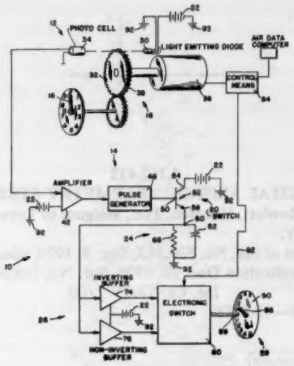


1. A digital seismic telemetry system for recording seismic data from a plurality of spatially separated seismic signal detectors positioned at selected spatially separated detector stations, comprising:
a plurality of remote seismic units, each being positioned at a seismic detector station, and each including;
remote storage means for storing seismic data from a detector in digital form;
converter means operably connected to said remote storage means for converting seismic data from a seismic detector into digital form and for supplying the digital seismic data to said remote storage means; and
remote transmitting means operably connected to said remote storage means for transmitting seismic data from said remote storage means to a master receiver, said remote transmitting means including transmission rate control means, responsive to a signal from a master control means, for controlling the rate at which said remote transmitting means transmits digital seismic data to said master receiver;
master receiver means for receiving transmitted seismic data from each of said plurality of remote seismic units;
master recorder means, operably connected to said master receiver, for recording received data from any of said remote seismic units; and
master control means, including a control transmitting means for transmitting control signals to each of said remote units, for controlling the selection of a remote unit and for controlling the rate of transmission of data from said remote seismic units to said master receiver means, whereby the number of and the transmission rate of said remote seismic units transmitting seismic data to said master receiver means at any given time is controlled.

4,112,413
RATE OF CHANGE IN ALTITUDE APPARATUS

Donald Paul Muhs, and Russell Frank Hart, both of Davenport, Iowa, assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 27, 1976, Ser. No. 726,882
Int. Cl.[2] G08B 5/36
U.S. Cl. 340—27 R 10 Claims



1. A rate of change in altitude indicating apparatus comprising:

a source of electrical current;

detector means for producing a sinusoidal input signal indicative of changes in altitude;

generator means connected to said detector means for generating a pulse signal representative of each positive node of said sinusoidal input signal;

first switch means responsive to said pulse signal to allow electrical current to flow from said source during the duration of each positive node;

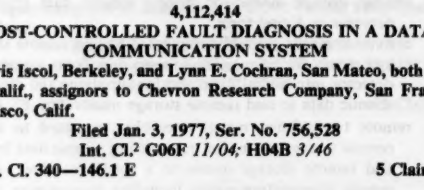
means responsive to said electrical current for creating a voltage signal which is directly proportional to the frequency of said sinusoidal input signal; and

indicator means responsive to said voltage signal for providing an operator with information relating to said rate of change of altitude.

4,112,414
HOST-CONTROLLED FAULT DIAGNOSIS IN A DATA COMMUNICATION SYSTEM

Lewis Iscol, Berkeley, and Lynn E. Cochran, San Mateo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 3, 1977, Ser. No. 756,528
Int. Cl.[2] G06F 11/04; H04B 3/46
U.S. Cl. 340—146.1 E 5 Claims

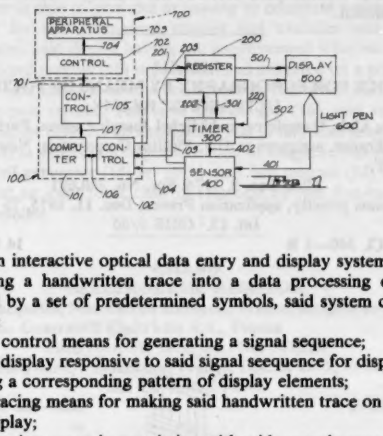


1. In the transfer of digital data between a host computer and one or more remote data terminals via a data communication system that includes one or more circuit elements supplied by a common carrier tariffed by the Federal Communications Commission and other circuit elements supplied by tariffed or nontariffed vendors, the improvement for automatically determining which of said circuit elements of said data communication system in a nonoperative state is faulty, comprising one or more diagnostic networks inserted logically between said elements of said data communication system, each selectively and independently operative in response to digital signals generated by and sent from a properly programmed host computer, said one or more diagnostic networks being selectively addressable using digital signals having the same protocol as said host computer uses in addressing said one or more data terminals of said data communication system, said one or more diagnostic networks each including first means for continuously monitoring all digital signals generated by said host computer and second means interconnected to said first means and selectively operating in response thereto to engage in an exchange of protocol and other messages with said host computer whereby said programmed host computer can determine rapidly which element of said data communication system is faulty.

4,112,415
SYSTEM FOR OPTICALLY ENTERING, DISPLAYING AND DECODING HANDWRITTEN SYMBOLS

Johan O. Hilbrink, 4002 Sharon Park Lane 24, Sharonville, Ohio 45241

Continuation-in-part of Ser. No. 635,884, Nov. 28, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 744,124
Int. Cl.[2] G06F 3/02; G06K 9/00
U.S. Cl. 340—146.3 SY 20 Claims



1. An interactive optical data entry and display system for decoding a handwritten trace into a data processing code defined by a set of predetermined symbols, said system comprising:

(a) a control means for generating a signal sequence;

(b) a display responsive to said signal seequence for displaying a corresponding pattern of display elements;

(c) tracing means for making said handwritten trace on said display;

(d) sensing means in association with said control means and said tracing means for identifying, in terms of a first coordinate and a second coordinate, the positions of those display elements passed over by said tracing means while making said handwritten trace; and

(e) computing means responsive to said sensing means and said control means comprising:

i. for each of said predetermined symbols, a stored trace uniquely corresponding thereto;

ii. means for comparing said handwritten trace with each of said stored traces such that the best comparison identifies said written trace as the symbol corresponding to the stored trace which caused said best comparison;

iii. means for tabulating a first ordered list of values corresponding to those of said first coordinates identified by said handwritten trace and a second ordered list of values corresponding to those of said second coordinates identified by said hand-written trace;

iv. a plurality of matrices; and

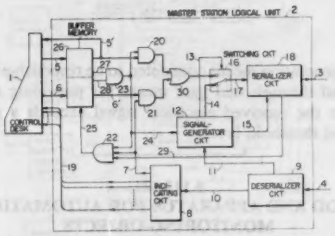
v. calculating means for multiplying one of said matrices with said first ordered list to derive a first vector and for

multiplying one of said matrices with said second ordered list to derive a second vector.

4,112,416
CONTROL METHOD FOR A REMOTE SUPERVISORY CONTROL SYSTEM

Akiji Hasegawa; Isao Yasuda, and Kazuhiko Kobayashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 8, 1976, Ser. No. 674,761
Claims priority, application Japan, Apr. 9, 1975, 50-42295
Int. Cl.[2] H04Q *5/00*
U.S. Cl. 340—147 R **4 Claims**



1. In a remote supervisory control system comprising a control desk operated by an operator, a single master station which receives signals from the control desk and a plurality of remote stations whose states are supervised and controlled by the master station, in which the master station has a buffer memory device for storing a selection signal selecting at least one from among the plurality of remote stations and an operation control signal for the selected remote station which are given by the operator through the control desk, a control method comprising:

a first step of storing the selection signal originated by the operator in said buffer memory device,

a second step of storing the operation control signal originated by the operator in said buffer memory device when it has been indicated on the control desk that the first step has been completed, the operation control signal corresponding to the predetermined remote station selected by the selection signal stored in said buffer memory device,

a third step of transmitting the selectionsignal from the buffer memory device to the selected remote station when both the selection signal and operation control signal have been stored in the buffer memory device,

a fourth step of transmitting a selection completion signal to the master station from the selected remote station,

a fifth step of transmitting the operation control signal stored in the buffer memory device to the selected remote station when the selection completion signal from the selected remote station has been received by the master station.

4,112,417
APPARATUS FOR DETECTING LEAKAGE OF LIQUID SODIUM

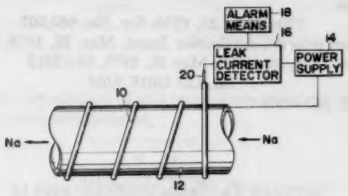
Yoshiaki Himeno, Mito, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Sep. 15, 1976, Ser. No. 723,637
Claims priority, application Japan, Sep. 18, 1975, 50-112117
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—605 **11 Claims**

1. An apparatus for detecting the leakage of liquid sodium through a wall of liquid sodium-containing equipment, said apparatus comprising:

an elongated cable-shaped sensor formed of an electrically conductive inner core wire, an electrically insulative layer consisting essentially of a metal oxide material surrounding said core wire, and an outer layer consisting essentially of a metal material surrounding said insulative layer and separated from said core wire by said insulative layer, said metal oxide material and said metal material being corrodible by the reaction products resulting from a reaction of liquid sodium with water vapor or oxygen in the atmospheric air, said cable-shaped sensor being deformable so that it may be conformed to the configuration of and directly secured to the wall of a liquid sodium-containing equipment at a position such that upon leakage of liquid sodium through the wall, reaction products are formed and contact said sensor and corrode said outer layer and insulative layer;

electric power supply means for applying a predetermined



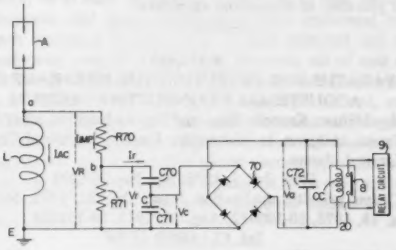
constant voltage between said core wire and the wall of a sodium-containing equipment, for thereby passing a relatively small current thrcugh said insulative layer and said outer layer between said core wire and the wall when there is no leakage of liquid sodium through the wall, and for passing an increased current between said core wire and the wall due to corrosion of said insulative layer upon leakage of liquid sodium through the wall; and

leak current detector means, connected in series to said power supply means, for detecting said increase in current as an indication of the leakage of liquid sodium through the wall.

4,112,418
LIGHTNING CURRENT RESPONSIVE ALARM

Toshio Ishikawa; Jun Ozawa, and Masaoki Tamura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 7, 1977, Ser. No. 766,568
Claims priority, application Japan, Feb. 25, 1976, 51-18921
Int. Cl.[2] G08B *21/00*; H02H *9/06*
U.S. Cl. 340—659 **14 Claims**



1. A lightning current responsive alarm device connected between protective coordination gap means, across which discharge takes place in response to the application of a lightning stroke voltage, and earth for alarming the operation of said protective coordination gap means, said alarm device comprising:

non-linear resistor means with a low voltage variation over a wide current range connected between said protective coordination gap means and earth,

capacitor means connected to said non-linear resistor means so that it is charged up with the drop voltage appearing across said non-linear resistor means,

sensor means operated by the discharge current of said capacitor, and

impedance means connected in parallel with said non-linear resistor means for providing a low impedance against a low frequency, but a high impedance against a high frequency.

4,112,419

APPARATUS FOR DETECTING THE NUMBER OF OBJECTS

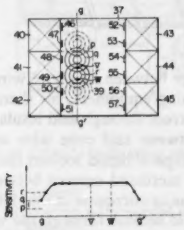
Hiroshi Kinoshita; Tatsuo Iwasaka, both of Katsuta, and Hisao Hanmura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 25, 1976, Ser. No. 669,802

Claims priority, application Japan, Mar. 28, 1975, 50-36956; May 26, 1975, 50-61958; May 28, 1975, 50-62912

Int. Cl.[2] G01S 9/66

U.S. Cl. 340—560 **9 Claims**



1. An apparatus for detecting the number of objects comprising: a plurality of transmitter-receivers, each of said transmitter-receivers including at least one transmitter for transmitting an ultrasonic wave or microwave signal toward the objects and at least one receiver for receiving the ultrasonic wave or microwave signal reflected from the objects, said transmitter-receivers being arranged to have respective detection regions overlapped with each other so that a uniform detection sensitivity may be obtained substantially over a surveillance area of the apparatus, a timing signal generator circuit for simultaneously energizing at least two adjacent transmitter-receivers to obtain a uniform detection sensitivity substantially over at least a portion of said surveillance area, and means for summing and integrating the outputs of the receivers included in said plurality of transmitter-receivers.

4,112,420

APPARATUS FOR DETECTING THE BREAKAGE OF AN ACOUSTICALLY CONDUCTIVE MEDIUM

Hideo Mifune; Kenroku Tani, and Toyota Noguchi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Company Limited, Japan

Filed Jul. 7, 1976, Ser. No. 703,291

Claims priority, application Japan, Jul. 31, 1975, 50-94020; Aug. 18, 1975, 50-100412; Aug. 20, 1975, 50-101354

Int. Cl.[2] G08B 13/04

U.S. Cl. 340—550 **11 Claims**

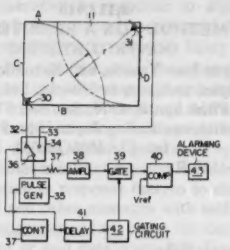
1. Apparatus for detecting breakage of an acoustically conductive medium, comprising:

means for generating an electrical pulse at predetermined intervals;

a piezoelectric transducer located in said acoustically conductive medium for transmitting said electrical pulse to the medium to introduce discrete elastic wave pulse vibrations in said medium and receiving vibrations from said medium to provide a received electrical signal;

discriminating gate means connected to said transducer for passing signals of which the amplitude is in excess of a predetermined value;

means for activating said gate means at delayed intervals from the instant of generation of said electrical pulse to detect said received electrical signal; and



alarm generating means connected to be responsive to pulses passed through said gate means for providing an alarm when the received electrical signal exceeds a predetermined threshold level.

4,112,421

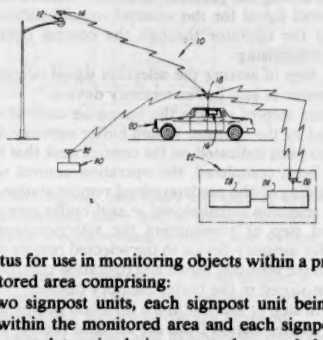
METHOD AND APPARATUS FOR AUTOMATICALLY MONITORING OBJECTS

Charles C. Freeny, Jr., Fort Worth, Tex., assignor to Information Identification Company, Inc., Ft. Worth, Tex.

Filed Apr. 16, 1975, Ser. No. 568,671

Int. Cl.[2] G01S 3/02

U.S. Cl. 343—112 D **53 Claims**



1. Apparatus for use in monitoring objects within a predetermined monitored area comprising:

at least two signpost units, each signpost unit being positioned within the monitored area and each signpost unit having a predetermined signpost code encoded therein identifying the signpost unit and providing an output signal encoded with the signpost code, each signpost unit outut signal establishing a far-field region extending a distance generally from the signpost unit, each signpost unit being positioned with respect to at least one other signpost unit so a portion of the far-field region of each signpost unit overlaps a portion of the far-field region of at least one other signpost unit, thereby forming an overlap region encompassing a predetermined coverage region with the monitored area;

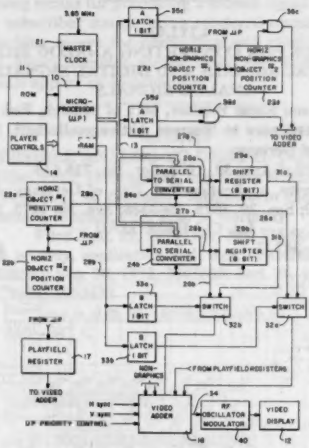
means in the monitored object receiving the signpost unit output signals having a portion detecting the signpost code encoded in the received signpost unit output signal and providing an output signal in response to the received signpost unit output signal for indicating the location of the monitored object as being within the far-field region of the signpost unit identified via the signpost code corresponding to the signpost code encoded in the received signpost unit output signal; and

means in the monitored object for determining and indicating the location of the monitored object as being within one of the overlap regions.

4,112,422
METHOD AND APPARATUS FOR GENERATING MOVING OBJECTS ON A VIDEO DISPLAY SCREEN

Steven T. Mayer, Auburn, and Ronald E. Milner, Grass Valley, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Dec. 13, 1976, Ser. No. 749,725
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 AD 9 Claims



1. A method of generating an object on a video display screen scanned in successive frames by an image forming beam traversing the screen along a plurality of horizontal lines in response to horizontal and vertical synchronizing signals and where a microprocessor has stored in its associated memory graphics data said method comprising the following steps: sensing the current vertical position of said scan and the desired vertical object position and storing a plurality of data bits, representing said graphics data, in a first memory under control of said microprocessor if an object is to be displayed; one horizontal line later shifting said data to a second memory while recirculating such data back into said first memory; sensing the horizontal window of said horizontal line where said data is to be displayed and causing said data from one of said first and second memories to be displayed on said screen in response to the vertical object position starting on the first or second line of a horizontal line pair; and in response to the next horizontal line repeating the display of the data in the previous line.

4,112,423
DUAL-SCREEN DATA DISPLAY TERMINAL FOR DATA PROCESSING UNITS

Robert B. Bertolasi, Rockford, Ill., assignor to Kelsey-Hayes Co., Romulus, Mich.

Filed Sep. 13, 1976, Ser. No. 722,727
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 AD 25 Claims

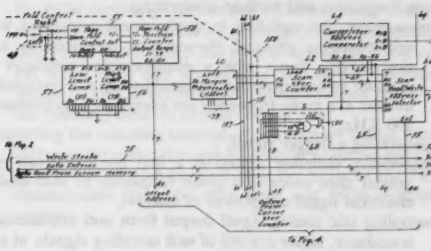
1. A data display terminal for displaying data received from a remote data processor or for entering data into a remote data processor including:

video display means including a pair of cathode ray tubes positioned side-by-side so that their associated screens form a substantially continuous display area;

memory means for sorting at least one computer page of data to be displayed on said screens;

input means for entering data into said memory means;

output means for reading data from said display memory means and providing said data to said video display means so that said data is displayed in sequence across said screens, including offset means for generating an offset and control means for controlling the positioning of said data within said display area in accordance with said offset

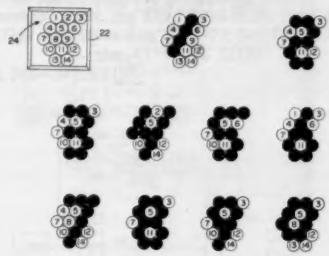


so that the junction of said two screens separates said data at a convenient location.

4,112,424
ALPHANUMERIC DISPLAY SYSTEM

James M. Lapeyre, New Orleans, La., assignor to Digicourse, Inc., New Orleans, La.

Filed Mar. 12, 1976, Ser. No. 666,456
The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—336 15 Claims



1. An alphanumeric display comprising:

an array of at least 14 and not more than 15 light emitting elements; said array consisting of four horizontal rows each including at least three of said elements and one horizontal row of at least two elements, all of said elements of said array being arranged in a nested relation so as to form at least four plural element columns, each inclined with respect to said horizontal rows at an angle of about 60° from the upper right to the lower left as seen by the viewer and at least five plural element columns, each inclined with respect to said horizontal rows at an angle of about 60° from the upper left to the lower right as seen by the viewer.

4,112,425
TRANSIENT ANALOG SIGNAL CAPTURE AND TRANSMISSION SYSTEM

Gerald J. Zobrist; William L. Townsend, and Steven K. Orr, all of Cincinnati, Ohio, assignors to Zonic Technical Laboratories, Inc., Cincinnati, Ohio

Filed Mar. 3, 1976, Ser. No. 663,356
Int. Cl.[2] H03K *13/00*
U.S. Cl. 340—347 AD 24 Claims

1. A method for monitoring a physical phenomenon manifested by a change in displacement produced by the application of a time-varying force capturing an analog electrical signal associated therewith having a component of interest at a given

frequency not exceeding approximately 100 KHz. and transmitting said captured signal over a low grade communication link having an upper frequency limit substantially less than said given frequency, said method comprising:

transducing the variation in displacement associated with said changing physical phenomenon produced by said time-varying force with a displacement transducer to produce an analog electrical signal having a component of interest at a given frequency not exceeding approximately 100 KHz.,

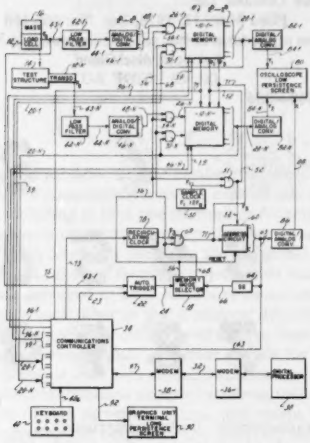
generating a trigger signal,

generating sampling signals at a first predetermined rate greater than twice said given frequency of said analog electrical signal component of interest,

sampling said analog signal output from said displacement transducer, under control of said sampling signals, at said first predetermined rate,

converting said analog signal samples output from said sampling means into digital signal samples, each digitized signal sample including plural data signals in parallel,

storing at said first predetermined rate, said digital signal samples output from said converter in a digital memory accessed under control of said trigger and sampling signals,



accessing said digital memory at a second predetermined rate substantially lower than 100 KHz., to ready for transmission, at said second predetermined rate, said stored digital signal samples, said transmission being via a communication link having a frequency response limit exceeding said second rate and substantially lower than 100 KHz.,

transmitting said stored plural data signals of each stored digital signal samples serially over the communication link at said second predetermined rate to a digital processor remote from said displacement transducer and said digital memory,

performing a mathematical transformation on said transmitted high frequency-containing digital samples in said digital processor to mathematically transform said high frequency-containing samples into a form useful for analyzing said physical phenomenon being monitored,

whereby digital signal samples containing a component of interest of an analog signal having a frequency not exceeding approximately 100 KHz. are conveyed to a remote digital processor for processing thereat over a low grade communication link having an upper frequency response limit which is substantially lower than 100 KHz. at a rate not exceeding said frequency response limit,

transmitting said processed signals from said remote processor over said low grade communication link at a receiving rate not exceeding said upper frequency response limit of said communication link, and

visually displaying said received processed signals transmitted from said digital processor, whereby interaction on a substantially real time basis occurs between said remote digital processor and test personnel at the site of said physical phenomenon being monitored whereat said transducer is located.

4,112,426

APPARATUS FOR CONVERTING ANALOG SIGNALS INTO DIGITAL SIGNALS AND DIGITAL SIGNALS INTO ANALOG SIGNALS

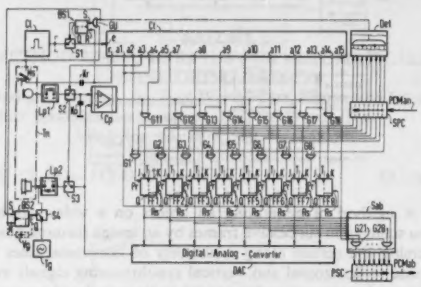
Ernst Höfer, and Klaus Wintzer, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 718,673

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1975, 2538580; Sep. 29, 1975, 2543388; Sep. 30, 1975, 2543608

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 C **6 Claims**



1. In a telecommunication system having subscriber stations constructed to send and receive analog signals and wherein signals are transmitted from subscriber station to subscriber station in digital form, apparatus for converting an incoming digital signal into an analog signal and an analog signal into an outgoing digital signal comprising:

input register means for receiving incoming digital signals;

buffer register means having a plurality of bistable stages having first inputs connected to said input register means for receiving the incoming digital signals;

digital to analog converter means having inputs connected to outputs of said bistable stages of said buffer register for converting the incoming digital signals to analog signals;

analog output means connected to receive the output of said digital to analog converter;

comparator means having one input connected to receive the output of said digital to analog converter and another input connected to receive an analog signal to be converted, the output of said comparator means being coupled to second inputs of said bistable stages of said buffer register;

output register means having inputs coupled to the outputs of said bistable stages of said buffer register for receiving the outgoing digital signals corresponding to the analog signal received by said another input of said comparator means;

multistage binary counter means having a predetermined starting position and a plurality of outputs coupled to said buffer register means for enabling said buffer register and said digital to analog converter to convert the incoming digital signals to analog signals during a first portion of the counting interval and for enabling the combination of said analog comparator, said buffer register and said analog to digital converter to convert analog signals to outgoing digital signals during a second portion of the counting interval;

clock generator means connected to said binary counter means for driving said binary counter means; and

initiating means for actuating said binary counter means responsive to the reception of a predetermined calling bit sequence in said input register means, said initiating means including detector means connected to said input register means for producing a first signal responsive to the appearance of the calling bit sequence in said input register, sensing means for producing a second signal responsive to the subscriber station being rendered operative and first switching means for connecting said clock generator to said binary counter means when said first and second signals appear in coincidence.

4,112,427

REVERSIBLE ANALOG-TO-DIGITAL CONVERTER

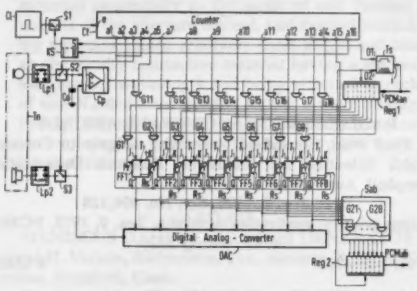
Ernst Höfer; Peter Hirschmann, and Klaus Wintzer, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 19, 1976, Ser. No. 715,864

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1975, 2538543; Sep. 30, 1975, 2543609; Sep. 29, 1975, 2543390; Nov. 28, 1975, 2553632

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 C **16 Claims**



1. A method of converting incoming PAM analog signals into outgoing PCM digital signals, and of converting incoming PCM digital signals into outgoing PAM analog signals in a telecommunication installation having telephone stations, each of said telephone stations comprising a transmitting unit supplying analog signals and a receiving unit accepting analog signals, wherein said telecommunication installation communicates with a PCM switching center by supplying PCM digital signals to said PCM switching center and receiving PCM digital signals from said PCM switching center, said telecommunication installation being in communication with said PCM switching center for the duration of the channel time slot pulses of the PCM channel time slot pulse train, said telecommunication installation comprising an analog-to-digital converter for the conversion of the incoming PAM analog signals into outgoing PCM digital signals, said analog-to-digital converter functioning according to the iterative principle and comprising a counter with a given counting interval, an intermediate register controlled by the outputs of said counter, a digital-to-analog converter following said intermediate register, and an analog comparator with one input connected to the output of said digital-to-analog converter and another input connected to receive analog signals from said transmitting unit which are intended to be converted into digital signals, the output signals of said comparator being supplied to said intermediate register, said telecommunication installation further comprising digital signal converting means including said intermediate register and said digital-to-analog converter for converting incoming PCM digital signals to outgoing PAM analog signals and sending the converted PCM digital signals to said receiving unit of said telephone station, the method comprising the steps of:

sharing the counting interval of said counter by converting the PCM digital signal from said PCM switching center to a PAM analog signal during a first portion of the counting interval of said counter and by converting the PAM analog signal from said transmitting unit of said telephone station to a PCM digital signal during a second portion of the counting interval of said counter; and,

initiating the counting interval of said counter within which said counter passes through all counter positions upon the appearance of each channel time slot pulse of the PCM channel time slot pulse train from said PCM switching center.

4,112,428

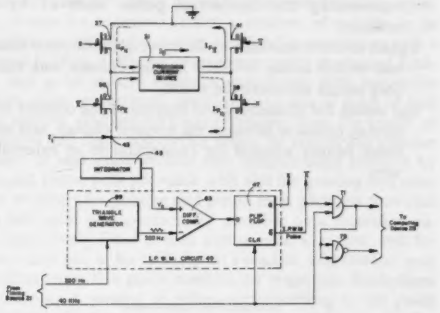
CLOCKED PRECISION INTEGRATING ANALOG TO DIGITAL CONVERTER SYSTEM

Adrian K. Dorsman, Bellflower, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 579,123, May 19, 1975, abandoned. This application Aug. 23, 1977, Ser. No. 827,046

Int. Cl.[2] H03K *13/20*

U.S. Cl. 340—347 NT **23 Claims**



1. An analog-to-digital conversion system comprising:

first means for generating a precision unipolar constant current;

a summing terminal for receiving an analog current;

means for enabling the precision unipolar constant current to flow by way of a first direction through said enabling means from a reference potential through said first means to said summing terminal during a first mode of operation and to flow by way of a second direction through said enabling means from said summing terminal through said first means to the reference potential during a second mode of operation;

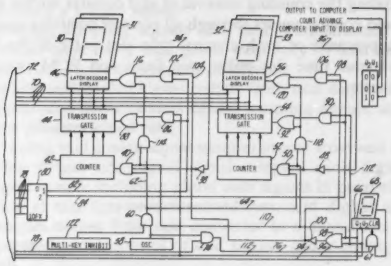
an integrator for generating a voltage signal proportional to the integral of the sum of the precision and analog currents flowing through said summing terminal; and

second means, coupled to said enabling means, being responsive to the voltage signal and to clock pulses for controlling the first and second modes of operation of said enabling means and for generating a digital representation of the amplitude of the analog current.

4,112,429
MULTIFUNCTION SEQUENCE OPERATED INTEGRATED SWITCH-DISPLAY DEVICE

Wallace K. Tsuha, 36048 Lucerne, Mt. Clemens, Mich. 48043, and Timothy R. Schlax, 3150 Bloomcrest, Rochester, Mich. 48063

Filed Jan. 30, 1976, Ser. No. 653,793
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—365 R **13 Claims**



1. A combined display-selector device for electronic data transmission systems comprising:

digital display means responsive to electronic actuation to provide a visual display of a numeric symbol on the face thereof;

switch means physically interconnected with said display means and responsive to manual contact with the face of said display means to assume a condition to pass an electrical signal;

a counter having an input for receiving electrical pulses and outputs for presenting in electrically coded form a signal representing the number of pulses received by said counter;

a pulse source connected to the input of the counter through said switch means whereby manual contact with the display means advances the count;

and means for connecting the outputs of the counter to the display means to advance the numeric display, said means being further adapted for connection to an external device.

4,112,430
BEAMFORMER FOR WIDEBAND SIGNALS

James A. Ladstatter, Baldwinsville, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

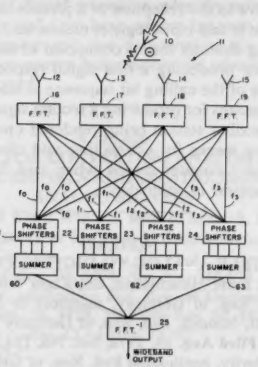
Filed Jun. 1, 1977, Ser. No. 802,330
Int. Cl.[2] G01S 3/74, 9/66
U.S. Cl. 343—100 R **12 Claims**

7. In a method for receiving a wideband signal, the steps of detecting said wideband signal with an array of sensors;

converting each elemental signal produced by a sensor into a multiplicity of narrowband signals,

said narrowband signals having frequencies that correspond to different Fourier coefficients which are present in said wideband signal;

forming a like multiplicity of narrowband directional beams from said multiplicity of narrowband signals; and

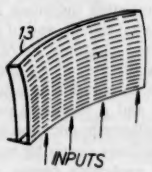


reconstructing said wideband signal from said narrowband beams.

4,112,431
RADIATORS FOR MICROWAVE AERIALS

John Paul Wild, Strathfield, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Jun. 8, 1976, Ser. No. 694,128
Claims priority, application Australia, Jun. 9, 1975, PC1921
Int. Cl.[2] H01Q 3/26
U.S. Cl. 343—768 **8 Claims**



1.A radiator for a microwave aerial for generating scanning planar radio beams comprising, a conducting parallel plate transmission system, said parallel plate

shaped as at least a segment of a cylindroid, said cylindroid having an axis of generation,

a regular two-dimensional array of slots in one of its parallel plates, said array comprising a columnar arrangement of slots, each slot having its long dimension in a plane perpendicular to the axis of generation of the cylidroid, and

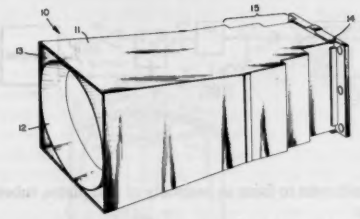
aperture means between one pair of parallel concentric edges of said plates, through which aperture means microwave power is fed into the parallel plate structure for transmission therethrough, the microwave power emerging from the slots in a plurality of adjacent columns of the array, forming a planar radio beam, the plane of said radio beam being coplanar with the axis of the cylindroid,

whereby distributed microwave excitation moves around said aperture means and is effective to cause the planar radio beam to scan about the axis of generation of the cylindroid.

4,112,432
SQUARE HORN ANTENNA HAVING IMPROVED ELLIPTICITY

Mon N. Wong, and Timothy A. Crail, both of Culver City, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 21, 1976, Ser. No. 734,707
Int. Cl.[2] H01Q *13/02;* H01P *5/12*
U.S. Cl. 343—786 **4 Claims**

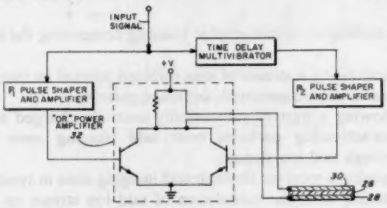


1. A horn antenna having improved ellipticity, comprising:
an N-sided horn antenna having a predetermined angle of flare, N being at least four, said horn having an input port and an aperture, said horn having a predetermined length; and
a right circular truncated hollow conical section being mounted tangentially to the inside of said N-sided horn antenna at the aperture thereof, said conical section having a predetermined relatively short length and being of an electrically conductive material having a thickness of less than 0.1 wavelength and being attached to each side of said N-sided horn antenna so that a wave propagating through said conical section is not attenuated, said conical section being for improving the ellipticity of a wave passing therethrough.

4,112,433
MENISCUS DAMPENING DROP GENERATOR

Richard H. Vernon, Richardson, Tex., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 634,315, Nov. 21, 1975, abandoned.
This application May 26, 1977, Ser. No. 800,833
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—1 **13 Claims**

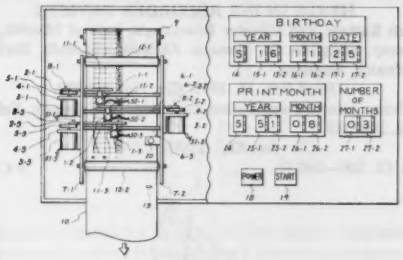


1. An ink jet assembly comprising: a droplet outlet orifice; a droplet producing pressure chamber means operatively communicated with said orifice to express a liquid droplet therethrough; means responsive to electrical pulses to effect a pressure increase in said chamber means; first means for effecting a first electrical pulse at said responsive means to effect a first pressure increase in the liquid in said chamber means; second means for effecting a second electrical pulse, which is separate from said first pulse, at said responsive means for effecting a second pressure increase in the liquid in said chamber means at a predetermined instant after said first pressure increase; the magnitude and duration of said first electrical pulse effecting said first pressure increase of such nature to express a liquid droplet from said droplet outlet orifice; the expression of a droplet from said droplet outlet orifice resulting in an inherent vibration amplitude of the meniscus formed in said outlet orifice after the droplet leaves therefrom; the predetermined instant, the magnitude and duration of said second electrical pulse effecting said second pressure increase of such nature to provide a pressure front at an effective meniscus dampening zone at substantially the instant the droplet leaves said orifice to substantially dampen the inherent vibration amplitude of the meniscus and decrease the period of meniscus stabilization.

4,112,434
BIORHYTHM CHART DRAWING-UP APPARATUS

Yujiro Shirai, No. 4-9 Sugamo 3-chome, Toshima-ku, and Akinori Satake, both of Tokyo, Japan, assignors to Yujiro Shirai, Tokyo, Japan

Filed Sep. 7, 1977, Ser. No. 831,158
Claims priority, application Japan, Sep. 10, 1976, 51-108448
Int. Cl.[2] G01D *9/00, 9/28;* A61B *5/00*
U.S. Cl. 346—33 ME **3 Claims**



1. A biorhythm chart drawing-up apparatus comprising digital switches for setting a date for the birthday of an examinee, a date for examination and a number of months to be recorded monthly, pulse motors provided in association with a physical rhythm, a rhythm of sentiment and a rhythm of intellect, said pulse motors rotate in association with respective periods, discs respectively coupled to an axis of each of said pulse motors, pins eccentrically extending from the center of respective said discs, converting means for converting circular motions of said pulse motors into reciprocating motions by T-shaped piston rods provided with slits for guiding said pins, guide members for guiding said piston rods, plungers provided with ball point pens contactedly movable on a recording paper, respectively fixed to said piston rods, a control unit for storing data put in by said digital switches, said control unit calculates respective guide numbers for respective biorhythms and provides a number of pulses corresponding to the guide number for placing said ball point pen at a starting point for drawing up a biorhythm chart, a feeding means for feeding said recording paper up to a distance determined by said digital switch for setting the number of months to be recorded, a first start controlling means, for detecting a reference position, provided in said recording paper, at a time of drawing up said chart for the first date in a month, which date arrives at a position below a first ball point pen positioned in a feeding direction and above said recording paper so as to initiate rotation of said pulse motor corresponding to the period of physical rhythm and energize said plunger to have said ball point pen contact said recording paper for drawing up said chart, a second start controlling means for initiating rotation of said pulse motor corresponding to a period of rhythm to be recorded and energize one of said plungers to have a second of said ball point pens contact said recording paper for drawing up said chart at a time when said first date in the month arrives below said second ball point pen arranged in a second position in the feeding direction of said recording paper, a third start controlling means for initiating rotation of said pulse motor corresponding to a period of rhythm to be recorded and energize one of said plungers to have a third of said ball point pens

contact said recording paper for drawing up said chart at a time when said first date in the month arrives below said third ball point pen arranged in a third position in the feeding direction of said recording paper, operation interruption means respectively combined with said start controlling means for interrupting rotations of said pulse motors and deenergizing said plungers upon completion of drawing said charts per one month, thereby continuing the feeding of said recording paper up the point of obtaining a feeding length specified by said input data from said digital switches and when detection of said reference position provided in said recording paper for the next month is carried out, the operation is repeated and detection of said reference position is carried out until completion of drawing up said chart for a number of months specified by said digital switches and thereafter, the feeding of said recording paper is stopped.

4,112,435

PROTECTIVE AND CLEANING DEVICE FOR WRITING HEADS IN INK RECORDER DEVICES

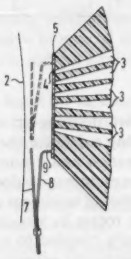
Erich Kattner, and Güenter Rosenstock, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 16, 1977, Ser. No. 769,099

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607313

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 R **9 Claims**



1. In an ink recording device having a writing head with a plurality of ink dispensing openings therein, the improvement of a shield device attached to the writing head, the shield device including a shield member positioned in front of the writing head and moveable between a blocking position opposed to the openings and an operating position away from the openings the shield member having a resilient means attached thereto, the resilient means having a wiping face associated therewith, the wiping face urged into contact with an end face of the writing head under spring action of the resilient means, movement of the shield from the blocking to the operating position causing movement of the wiping face across an end face of the writing head.

4,112,436

GLASS NOZZLE ARRAY FOR AN INK JET PRINTER AND METHOD OF FORMING SAME

Donald Roy Cone, Palo Alto, Calif., assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 24, 1977, Ser. No. 771,523

Int. Cl.² G01D *15/18*; B23P *17/00*

U.S. Cl. 346—140 R **20 Claims**

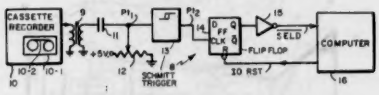
1. A method of forming a glass nozzle array for use in an ink jet printing apparatus as part of an orifice plate, charge ring assembly or the like, the steps comprising:

supporting a plurality of cylindrical glass tubes in spaced parallel alignment;

placing a first plate beneath said tubes in a plane parallel thereto;

spreading epoxy resin through the spaces between said tubes and onto the upper surface of said first plate;

placing a second plate above said tubes in a plane parallel to said first plate and having a lower surface in contact with said epoxy resin;



curing said resin to form an assembly of said plates, tubes and epoxy;

cutting said assembly orthogonal to the axes of said tubes at a predetermined thickness to form said nozzle array.

4,112,437

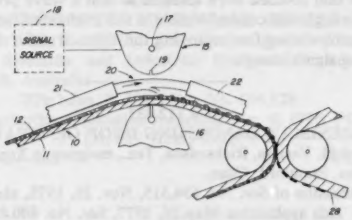
ELECTROGRAPHIC MIST DEVELOPMENT APPARATUS AND METHOD

José Manuel Mir, Webster, and Jerry Reubon Varner, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,142

Int. Cl.² G03G *15/044*

U.S. Cl. 346—159 **18 Claims**



1. A method of electrographic imaging comprising the steps of:

(a) modulating a stream of ions directed toward an imaging zone in accordance with an image pattern;

(b) flowing a mist of substantially-neutrally-charged colorant-activating particles over said imaging zone and through said ion stream;

(c) moving a receiver through said imaging zone in synchronization with the modulation of said ion stream so that colorant-activating particles can deposit thereon in said image pattern; and

(d) providing a developer for contacting deposited particles and for cooperating with such particles to form a developed image pattern.

4,112,438

METHOD AND PROJECTION APPARATUS

Dale A. Jones, 11A Bayview La., Huntington, N.Y. 11743

Filed Jul. 18, 1977, Ser. No. 816,443

Int. Cl.² G03B *21/06, 21/28*

U.S. Cl. 353—66 **23 Claims**

1. In an apparatus for the projection of a completed image of an incomplete object,

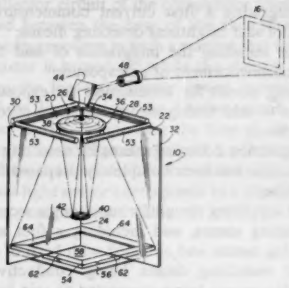
at least two reflective surfaces perpendicularly arranged relative to each other to complete the reflection of an

incomplete object positioned in an area partially bounded by said mirrors,

means for illuminating the incomplete object,

a parabolic reflector to receive the completed reflection of the incomplete object and to reflect the same in condensed form as a completed image,

a reflective member receiving said condensed completed image to reflect the same through said parabolic reflector,



means on said parabolic reflector to permit said condensed completed image to pass through the same, and

a further reflective means angled to receive said completed reflected image after the same is directed through said parabolic reflector and to reflect the completed image onto a surface such that the image reflected onto a surface appears to be the reflection of a completed image of the incomplete object.

4,112,439

DIGITAL DISPLAY CIRCUIT FOR A PHOTOGRAPHIC EXPOSURE METER

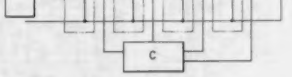
Masahiro Kawasaki, and Yoshio Sawada, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1976, Ser. No. 744,851

Claims priority, application Japan, Nov. 25, 1975, 50-140,917

Int. Cl.[2] G03B *7/08, 17/20*

U.S. Cl. 354—23 D **6 Claims**



1. An analog-to-digital converter circuit for a photographic exposure meter, comprising;

a. a light measuring circuit for producing an output voltage proportional to the logarithm of the brightness of an object as a function of predetermined photographic parameters,

b. a plurality of transistors connected in parallel and having equal emitter areas,

c. means connecting the output voltage of said light measuring circuit to the base of each of said transistors,

d. an equal plurality of constant current sources for producing output currents differing from each other in accordance with a predetermined ratio, and

e. means individually connecting the outputs of said constant current sources to the collectors of said plurality of transistors, whereby the voltages produced at the collectors of said plurality of transistors represent a digital threshold conversion of the output voltage of said light measuring circuit in accordance with said predetermined ratio.

4,112,440

CONTROL CIRCUIT FOR EXPOSURE INFORMATION INDICATOR

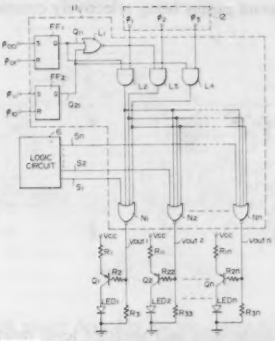
Kenji Kanemaru, Musashino, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Feb. 25, 1977, Ser. No. 771,994

Claims priority, application Japan, Feb. 25, 1976, 51-18960

Int. Cl.[2] G03B *17/20*

U.S. Cl. 354—23 D **4 Claims**



1. A control circuit for an exposure information indicator in a photographic camera in which a light measuring photoreceptor is connected to a circuit for converting the output of the photoreceptor to a voltage indicative of the scene brightness measured by the photoreceptor, and the output of the circuit is used for indicating exposure information by means of a light emitting indicator wherein the improvement comprises means connected with said converting circuit for generating a plurality of digital output signals which represent the level of the output voltage of said converting circuit, a plurality of means for generating pulses which have different duty cycles, and a selecting circuit connected at its input with said signal generating circuit and said plurality of pulse generating means and at its output with said light emitting indicator for selecting said plurality of digital output signals and selecting said pulses of different duty cycles to be fed to the light emitting indicator, whereby the luminance of the light emitting indicator is controlled to correspond to the scene brightness.

4,112,441

EXPOSURE CONTROL DEVICE

Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,012

Claims priority, application Japan, Dec. 26, 1974, 50-4470[U]

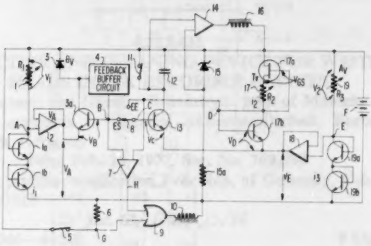
Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—24 **3 Claims**

1. An automatic exposure control device for a camera, said device being capable of accomplishing at least the aperture cominant exposure control operation and the shutter dominant exposure control operation, said device being of the type having a logarithmic compression circuit for developing voltages V_E, V_D, V_A and V_B dependent on the APEX indicating quantities Av, Tv, Sv and Bv, respectively, of aperture level A, manual exposure time T, film sensitivity S and brightness of an object B, so as to carry out the APEX operation in accordance with the relationship of $Av + Tv = Sv + Bv$; shutter speed control means for said camera having an input circuit means, said shutter speed control means being adapted to control the shutter speed in dependence upon the voltage applied to said input means, an aperture level determining means selectively

operative to start adjustment of the aperture mechanism of said camera in response to the shutter release operation of said camera and to carry out said adjustment at a predetermined speed; said logarithmic compression circuit means including an aperture transducer means coactive with said aperture level determining means to develop said voltage V_E dependent upon the Av quantity; the improvement being characterized by

a. automatic aperture circuit means responsive to the voltages corresponding to the Bv, Sv and manually set Tv quantities for stopping the aperture level determining means when the aperture mechanism is closed down an amount to cause said developed voltage V_E to become equal or greater than $(V_A+V_B-V_D)$, said automatic aperture circuit means being selectively connectable and dis-



connectable with said aperture level determining means for shutter dominant and aperture dominant operations, respectively, and

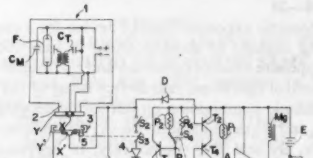
b. switchable shutter circuit means for selectively applying to said input circuit of said shutter control circuit, a voltage dependent directly upon V_D for shuter preferred operation and a voltage dependent upon $(V_A+V_B-V_E)$ for aperture dominant operation, wherein said switchable shutter circuit means comprises, a transistor having base, emitter and collector terminals, said emitter being connected to said voltage V_E, said collector being connected to said shutter speed conrol means, and switch means selectively connecting the base of said transistor to a point of voltage V_A+V_B for aperture dominant operation and to a point of voltage V_D+V_E for shutter dominant operation.

4,112,442

CAMERAS WITH ELECTRICALLY CONTROLLED EXPOSURE FOR USE WITH ELECTRONIC FLASH DEVICE

Keisuke Maeda, Osaka, and Seiji Yamada, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 17, 1976, Ser. No. 742,427
Claims priority, application Japan, Dec. 4, 1975, 50-145357
Int. Cl.[2] G03B *15/05*
U.S. Cl. 354—31 **9 Claims**



1. A camera for use with an electronic flash device including a flash tube, said camera comprising:

brightness detecting means for generating an output commensurate with the brightness of an object;

level detecting means for detecting the level of the output of said brightness detecting means to generate a low brightness signal only when the brightness of the object is lower than a first predetermined level;

firing circuit means connected to said level detecting means for conditioning said flash tube to fire in the presence of said low brightness signal;

timing means connected to said brightness detecting means for integrating a first current commensurate with the output of said brightness detecting means;

means for initiating the integration of said timing means upon commencement of an exposure;

a switching circuit for terminating the exposure when the voltage of said timing means reaches a second predetermined level;

flash preparation detecting means for detecting whether said flash device has been completely prepared for firing said flash tube;

a current supplying circuit for supplying a second current to said timing means, and including a first and a second switching means and actuated with both of said first and second switching means being conductive, said first switching means being connected to said level detecting means to be conditioned to be conductive in the presence of said low brightness level signal and said second switching means being connected to said flash preparation detecting means to be conditioned to be conductive upon detection of completion of the preparation of said flash device for firing said flash tube, and said second current causing the voltage of said timing means to reach said second predetermined level sooner than with only said first current supplied to said timing means; and

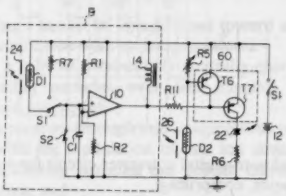
trigger means responsive to the initiation of exposure for actuating said firing circuit and for initiating conduction of said first and second switching means.

4,112,443

SHUTTER AND LOW-LIGHT INDICATOR ACTUATING DEVICE FOR A CAMERA

Susumi Iguchi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 760,889
Claims priority, application Japan, Jan. 26, 1976, 51-7658; Jan. 27, 1976, 51-8190; Jan. 27, 1976, 51-8492[U]
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—31 **4 Claims**



1. A shutter and low-light indicator actuating device comprising:

a D.C. voltage source;

light sensitive shutter actuator means powered by the voltage source for producing an electric shutter opening signal for a length of time corresponding to the sensed light level;

light sensitive low-light sensor means connected directly across the voltage source for producing an electric signal analogous to the sensed level; and

comparator means connected to the low-light sensor means and the shutter actuator means for producing an electric indicator activating signal only while the electrical signal

produced by the low-light sensor means corresponds to a sensed light level below a predetermined value and the shutter opening signal is produced by the shutter actuator means;

the comparator means comprising an indicator current switching transistor, the shutter actuator means being connected to a base of the switching transistor, and a voltage comparator transistor, a base of the comparator transistor being connected to the low-light sensor means and a collector circuit of the comparator transistor being connected between the base of the switching transistor and the voltage source in such a manner that the comparator transistor is turned off while the electric signal produced by the low-light sensor means corresponds to a sensed light level below the predetermined value and turned on thereby connecting the base of the switching transistor to the voltage source with a polarity to turn off the switching transistor while the electric signal produced by the low-light sensor corresponds to a sensed light level above the predetermined value.

4,112,444

CAMERA WITH PHOTOFLASH MEANS AND DATA PHOTOGRAPHIC MEANS OPERATED WITH SINGLE BATTERY

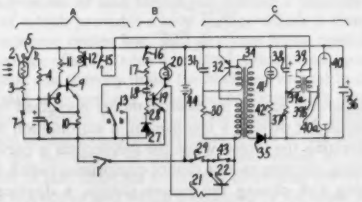
Tomoo Yonemoto; Yukio Morino; Hiroaki Ishida, and Shinji Nagaoka, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Aug. 17, 1977, Ser. No. 825,400

Claims priority, application Japan, Aug. 17, 1976, 51-109784[U]; Aug. 17, 1976, 51-109785[U]

Int. Cl.² G03B *17/24, 15/03*

U.S. Cl. 354—106 **4 Claims**



1. A camera with at least photoflash means and data photographic means operated with a single battery, said photoflash means having means for performing its preparatory operation of charging a main capacitor with high voltage produced in a step-up circuit by electrical oscillation with the battery used as a power source and its flash operation in synchronization with exposure operation for flash photography, said data photographic means being so arranged as to electrically control its operation of recording data on film with the same battery used as a power source, said camera comprising means for interrupting the preparatory operation of the photoflash means with an operating signal for the data photographic means during its recording operation, in case a picture is taken by operating the photoflash means and the data photographic means.

4,112,445

TELEVISION PLAYER WITH AN IDENTIFICATION SIGNAL ADDING DEVICE

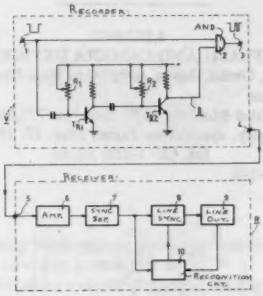
Wolfgang Otto Gotthard Steinkopf, Eindhoven, Netherlands, and Rudolf Drabek, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 592,866, Jul. 3, 1975. This application Jan. 31, 1977, Ser. No. 763,982

Claims priority, application Netherlands, Jul. 15, 1974, 7409514

Int. Cl.² G11B *5/02*

U.S. Cl. 358—127 **19 Claims**



1. A television player desirably for use with a receiver having an identification signal recognition circuit, said player comprising a video storage device means for storing a recorded video signal, and means for adding an identification signal at specific predetermined locations to said video signal so that said recorded video signal can be distinguished upon playback by said recognition circuit of said receiver from a standard broadcast television signal, said identification signal not being detected in said player and being compatible with a standard broadcast television signal, whereby said recorded video signal with said added identification signal can be reproduced by a receiver not having said identification signal recognition circuit.

4,112,446

EXPOSURE CONTROL CIRCUIT FOR CAMERAS WITH SHUTTER RELEASE LOCKING MEANS

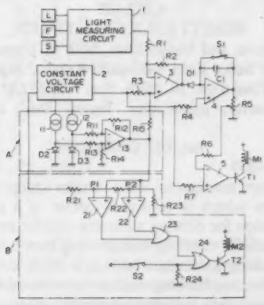
Saburo Numata, and Shinichiro Okazaki, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya-shi, Japan

Filed Jul. 15, 1977, Ser. No. 816,187

Claims priority, application Japan, Jul. 17, 1976, 51-85400

Int. Cl.² G03B *7/08, 17/38*

U.S. Cl. 354—50 **6 Claims**



1. An exposure control circuit for a camera with a shutter release locking means comprises a light measuring circuit for measuring the scene brightness, an arithmetic circuit con-

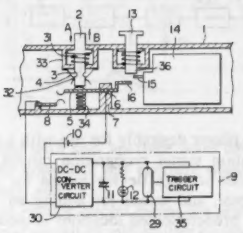
nected with the light measuring circuit, and an exposure determining circuit connected with the arithmetic circuit for determining the exposure of a film in the camera according to the output of the arithmetic circuit, wherein the improvement comprising a temperature compensating circuit which measures the ambient temperature of the camera and compensates the output of said arithmetic circuit for the temperature, said temperature compensating circuit having a compensable range in which the output of the arithmetic circuit can be correctly compensated for the ambient temperature, and a shutter release locking circuit connected with said temperature compensating circuit for locking the shutter release when the ambient temperature is beyond the compensable range.

4,112,447

FLASH AND CAMERA DEVICE

Hiroshi Iwata, Osaka, Japan, assignor to West Electric Co, Ltd., Osaka, Japan

Filed Mar. 14, 1977, Ser. No. 777,351
Claims priority, application Japan, Mar. 17, 1976, 51-29511
Int. Cl.² G03B *17/38*
U.S. Cl. 354—145 **3 Claims**



1. A flash and camera device having in combination a photographic camera device and an electronic flash device in which energy stored in a main discharge capacitor is consumed by a flash discharge tube to emit flash light, comprising:

a power supply battery;

a switch having a pair of electric contacts which when closed connects said power supply battery to said electronic flash device;

a closing means movable between a switch opening and switch closing position for closing said switch;

a lock means for maintaining said closing means in said switch closing position; and

a releasing means operative in response to the depression of a shutter button of said photographic camera device for releasing said lock means and allowing said closing means to move to said switch opening position.

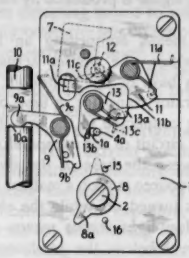
4,112,448

RESETTABLE SELF-TIMER

Yukio Nakamura, and Shogo Kato, both of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Dec. 20, 1976, Ser. No. 752,557
Claims priority, application Japan, Dec. 19, 1975, 50-171639[U]
Int. Cl.² G03B *9/64*
U.S. Cl. 354—239 **9 Claims**

1. A self-timer mechanism for a camera comprising rotatable driving means which is biased to rotate in a predetermined angular direction for driving a camera shutter release member, charging means for rotating said driving means in the opposite angular direction, a member having a drive connection with said driving means, locking means for releasably locking the said member and thus said driving means, release means which is movable into a released position for releasing said locking means to permit said driving means to rotate in the said predetermined angular direction, and drive disconnection means which, whenever said charging means is operated to rotate said driving means in the said opposite angular direction, effects disconnection of said connection and movement of said



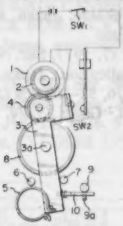
locking means into its locked position, the said drive connection being automatically restored when the charging means is no longer so operated.

4,112,449

STOP MOTION DEVICE FOR MOTOR DRIVEN DEVICE

Shigeo Akasaka, Kodaira, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 15, 1976, Ser. No. 723,583
Claims priority, application Japan, Oct. 4, 1975, 50-119378
Int. Cl.² G03B *1/18*; B65H *25/04*
U.S. Cl. 354—173 **10 Claims**



1. In apparatus having an electric motor energized from a power circuit for driving a mechanism, a stop motion device for deenergizing the motor when the mechanism is prevented from moving, the stop motion device comprising switch means for opening and closing the power circuit, a displacement member displaceable between a closing position for closing the switch means and an opening position for opening the switch means, means for urging the displacement member in the direction of the closing position when the displacement member is positioned at the closing position, a first transmission member rotatably supported on the displacement member and rotated in response to energization of the motor, a second transmission member engaged with the first transmission member and normally rotated thereby to drive said mechanism, and means supporting said displacement member such that when said mechanism is prevented from moving and the second transmission member is stopped, the first transmission member is compelled to turn around the second transmission member by the driving force of the motor and to displace the displacement member to the opening position.

4,112,450

SHUTTER DEVICE FOR A PHOTOGRAPHIC CAMERA

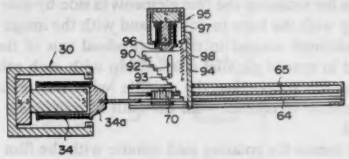
Toshihiro Kondo, Chofu, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan, a part interest

Filed Feb. 16, 1977, Ser. No. 769,299

Claims priority, application Japan, Feb. 18, 1976, 51-16765; Apr. 12, 1976, 51-41135; Apr. 1, 1976, 51-36282; Mar. 26, 1976, 51-33764; Mar. 31, 1976, 51-39255[U]

Int. Cl.[2] G03B 9/14, 9/24, 9/40, 9/62

U.S. Cl. 354—235 **5 Claims**



1. In a shutter device for a photographic camera, the combination of, a permanent magnet unit comprising an elongated central pole and an outer pole extending parallel thereto, said poles being of opposite polarity and forming a magnetic gap at one end of said central pole, shutter means including a pair of shutter blades each of which has an exposure window, said blades being positioned in side-by-side relationship and being adapted to move longitudinally of a common center line progressively between an exposure position in which said windows are in alignment and a non-exposure position in which the window in each of said blades is closed by the other of said blades, means mounting said blades for said longitudinal movement, said common center line being in substantial alignment with the central portion of said central pole, an electromagnet operatively connected to one of said blades and positioned around said central pole and adapted to move longitudinally through said magnetic gap, means constituting an electric power source including control means to supply electric current to said electromagnet and to reverse the direction of flow therethrough whereby said electromagnet is moved back and forth along an operating path parallel to said common center line, said electromagnet being operatively connected to one of said blades, means mechanical interconnecting said blades whereby said movement of one of them in one direction causes the other blade to move simultaneously in the other direction, a step cam positioned to move perpendicular to said longitudinal movement of said blades and having a plurality of steps each of which provides a stop surface which is transverse to said common center line, said step cam being operatively related to one of said blades whereby it presents a stop surface to the blade and thereby limits the blade movement in one direction, said stop surfaces being spaced from each other in the direction parallel to said common center line whereby the position of said step cam determines which of said stop surfaces limits the movement of the blade, and means to control the position of said step cam to thereby determine the step surface on the respective step which is engaged by the blade and hence the size of the exposure opening provided by overlapping portions of said windows in said plates.

4,112,451

LOW-INERTIA ELECTRONIC SHUTTER

Graham Edward Asker, Ware, England, assignor to Eastman Kodak Company, Rochester, N.Y.

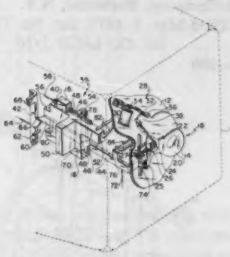
Filed Mar. 22, 1977, Ser. No. 780,150

Int. Cl.[2] G03B 9/16, 9/62

U.S. Cl. 354—258 **3 Claims**

1. In a photographic camera, an improved shutter of the type having an opening blade movable from an aperture covering position to an aperture uncovering position to initiate an exposure, a closing blade movable from an aperture uncovering position to terminate the exposure, a latch actuatable for releasably holding said closing blade in its aperture uncovering position, and an impact member movable between a cocked position and a released position and adapted to engage a portion of said opening blade upon movement from the cocked position to the released position to move said opening blade from its aperture covering position to its aperture uncovering position, the improvement comprising:

said opening blade including a portion disposed to engage said impact member while in its cocked position to secure



said opening blade against inadvertent movement from its aperture covering position; and

said latch including a cantilever spring the free end of which is adapted to engage a portion of said closing blade, and an electromagnet operatively coupled to said spring, said electromagnet having (1) a first state in which the free end of said spring is urged into latching engagement with said closing blade, and (2) a second state in which said closing blade is released for movement relative to said spring to its aperture covering position.

4,112,452

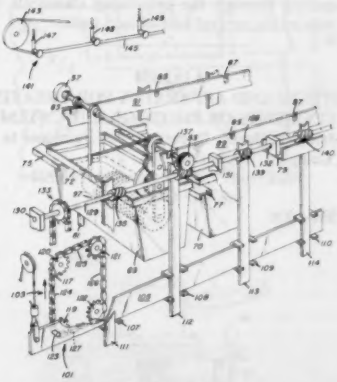
APPARATUS FOR PROCESSING PHOTOGRAPHIC FILM

David Lynn Patton, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 7, 1977, Ser. No. 774,721

Int. Cl.[2] G03D 3/04

U.S. Cl. 354—322 **12 Claims**



1. Apparatus for processing in successive baths of processing solutions a plurality of disc-shaped photographic film elements on a spindle, each respective element having a substantially flat imaging surface, the spindle supporting the elements with the imaging surfaces in closely spaced parallel relation relative to each other and defining a longitudinal axis passing through central sections of the elements; said apparatus comprising:

transport means for automatically conveying the spindle and

thereby the film elements between the successive baths and for automatically immersing the elements edgewise, with the spindle axis horizontal, in one bath after another; and

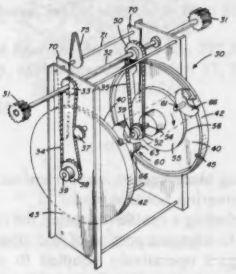
drive means for spinning the film elements about the spindle axis to agitate the elements in each respective bath.

4,112,453

ROTARY FILM PROCESSING APPARATUS

William Joseph Hutchison, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 7, 1977, Ser. No. 774,717
Int. Cl.[2] G03D *3/10*
U.S. Cl. 354—330 **12 Claims**



1. Processing apparatus for processing in photographic processing chemicals a plurality of photographic film elements supported on a common shaft passing through apertures in the central portions of the film elements, said apparatus comprising:

a processing tank for containing photographic processing chemicals, the processing tank having a first side and a second side opposite the first side;

means for supporting the shaft in said processing tank;

means for transporting the supported shaft through the processing tank downwardly from the first side and upwardly toward the second side; and

means for rotating the supported film elements during transport of the supported shaft through said processing tank;

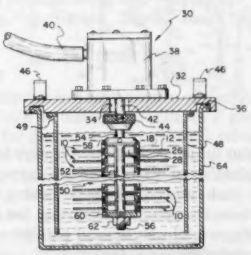
whereby the film elements are simultaneously rotated and transported through the processing chemicals from the first side to the second side of said tank.

4,112,454

METHOD AND APPARATUS FOR TREATING ELEMENTS OF PHOTOGRAPHIC FILM

Donald Malcolm Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 7, 1977, Ser. No. 774,722
Int. Cl.[2] G03D *3/04*
U.S. Cl. 354—330 **8 Claims**



1. Apparatus for processing in a bath of processing solution a plurality of individual photographic film elements, each film element having a centrally-apertured hub having a predetermined thickness and a flat image support having a predetermined thickness less than the thickness of the hub; said apparatus comprising:

an elongate spindle adapted to extend through the hub apertures to receive the film elements;

means for inhibiting relative rotation between said spindle and the film elements, whereby rotation of said spindle on its longitudinal axis will rotate the film elements on such axis;

means for retaining the film elements in side-by-side relationship with the hubs in contact and with the image supports positioned normal to the longitudinal axis of the spindle and in spaced parallel relationship with each other;

means for supporting the spindle with the retained film elements in contact with the bath of processing solution; and

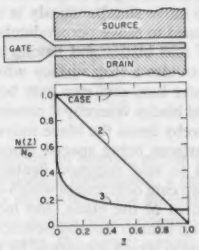
drive means for rotating said spindle with the film elements in contact with the solution to agitate the film elements in the solution and thereby enhance the contact between the film elements and the solution.

4,112,455

FIELD-EFFECT TRANSISTOR WITH EXTENDED LINEAR LOGARITHMIC TRANSCONDUCTANCE

Robert L. Seliger, Agoura, and James W. Ward, Canoga Park, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,265
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **2 Claims**



1. A field-effect transistor of the type having a source region, a drain region and a channel region within which current flow takes place between said source and drain regions

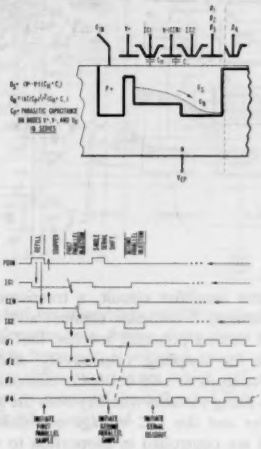
said channel region having a length dimension which is uniform and corresponds to the distance over which said current travels as it flows between said source and drain regions of said transistor and having a width dimension which is perpendicular to said length dimension and to the direction along which said current travels as it flows between said source and drain regions,

said channel region having a non-linear dopant profile along its width dimension which is such that said field-effect transistor exhibits a logarithmic transconductance which is linear with gate signal voltage over an extended range.

4,112,456
STABILIZED CHARGE INJECTOR FOR CHARGE COUPLED DEVICES WITH MEANS FOR INCREASING THE SPEED OF PROPAGATION OF CHARGE CARRIERS

Donald R. Lampe, Ellicott City; Marvin H. White, Laurel, and Arthur S. Jensen, Baltimore, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 507,115, Sep. 17, 1974, abandoned. This application Oct. 24, 1975, Ser. No. 625,701
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—24 **14 Claims**



14. A method of controlling a stabilized charge injection for injecting charges into a receiving well of a charge transfer device, said charge transfer device including an input source/drain region contacted by a source/drain electrode, and, in succession, a first electrode, a first gate electrode, a second electrode, and a second gate electrode, capacitance means associated with said second electrode and said first gate electrode for increasing the speed of propagation of charges,

wherein said method includes the steps of:

applying an input signal to one of said first and second electrodes, and

applying control signals to said source/drain electrode to operate said region as a source of minority carriers;

rendering said first gate and said second electrode attractive in succession to fill the potential well defined by said first gate electrode and said second electrode with said charge carriers;

operating said diffusion region as a drain to remove excess carriers in a scupper operation, and a transfer process including maintaining said second gate electrode attractive and said first electrode, said second electrode, and said first gate electrode repulsive for injecting charges into a receiving well of said charge transfer device.

4,112,457
PHOTOVOLTAIC DEVICE HAVING AN EXTENDED PN JUNCTION

Robert Vincent D'Aiello, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

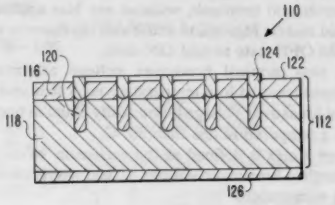
Filed Nov. 1, 1976, Ser. No. 737,915
Int. Cl.[2] H01L *31/06*
U.S. Cl. 357—30 **5 Claims**

1. A photovoltaic device having a body of semiconductor material comprising:

(a) a first region of semiconductor material of one conductivity type and having a predetermined degree of conductivity, said first region having an incident surface where incident radiation is capable of impinging said device;

(b) a second region of semiconductor material of conductivity type opposite to that of said first region, contiguous to said first region and defining therewith a portion of a PN junction;

(c) a plurality of pocket regions electrically coupled to said first region, said pocket regions being of said one conductivity type, said pocket regions defining with said second region further portions of said PN junction, said pocket regions extending from below the incident surface of said first region into said second region thereby extending said PN junction into said second region;



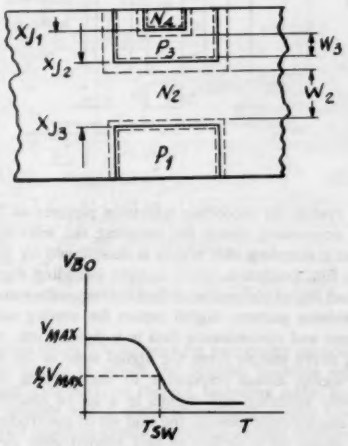
(d) a first electrode in said first region electrically contacting said pocket regions and said first region; and

(e) a second electrode on a surlface of said body opposite said incident surface.

4,112,458
SILICON THYRISTOR SENSITIVE TO LOW TEMPERATURE WITH THERMAL SWITCHING CHARACTERISTICS AT TEMPERATURES LESS THAN 50° C

Stanley V. Jaskolski, Sussex; Robert W. Lade, Waukesha; Herman P. Schutten, Elm Grove, and Gordon B. Spellman, Mequon, all of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jan. 26, 1976, Ser. No. 652,192
Int. Cl.[2] H01L *29/74*
U.S. Cl. 357—38 **14 Claims**



1. A silicon thyristor comprising a bistable semiconductor device comprising three junctions of opposite conductivity type silicon,

said thyristor having a plurality of middle regions disposed between two end regions,

each said end region having a terminal connected thereto,

said thyristor having a low current, high resistance OFF state and a high current, low resistance ON state between said terminals,

said thyristor having a two terminal breakover voltage defined as the magnitude of voltage required to be applied across said terminals, without any bias applied to any of said middle regions, to cause said thyristor to switch from said OFF state to said ON state,

said two terminal breakover voltage exhibiting thermal dependency at low temperature such that said two terminal breakover voltage is nominally equal to one-half Vmax at a temperature less than 50° C,

where Vmax is defined as the maximum value of said two terminal breakover voltage of said thyristor with respect to temperature.

4,112,459

TELEVISION PICTURE PHOTOGRAPHIC FILM RECORDING SYSTEM

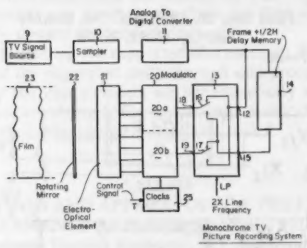
Christian Jean Gautier, Acigne; Bernard Marti, Noyal, Vilaine; Michel Robert Mauduit, Pace; André Jean-Francois Louineau, Janze, and Christiane Schwartz nee Luneau, Cesson-Sevigne, all of France, assignors to Etablissement Public dit "Telediffusion de France", Montrouge, France

Filed Sep. 23, 1976, Ser. No. 725,727

Claims priority, application France, Oct. 6, 1975, 75 31014

Int. Cl.[2] H04N *5/84*

U.S. Cl. 358—6 **12 Claims**



1. A system for recording television pictures on film, said system comprising means for sampling the television video signal at a sampling rate which is determined by the photographic film resolution, every sample including digital luminance and digital chrominance data corresponding to a point in the television picture, digital means for storing said digital luminance and chrominance data in a digital form, means for reading every sample from the digital store in the form of a digital signal, means responsive to said reading means for selectively applying said signals to a set of electrodes of a steady electro-optic device, the said set of electrodes producing an image on a surface of said electro-optic device, and means including a photographic film camera for recording said image in either monochrome or polychrome, the image produced by said set of electrodes being a light point having a luminous intensity and color, which varies as a function of the sample contents.

4,112,460

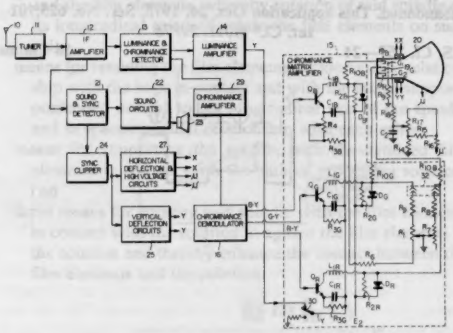
SIMPLIFIED BIAS AND GAIN ADJUST SYSTEM FOR COLOR CATHODE RAY TUBE

Blayne E. Arneson, Evergreen Park, Ill., assignor to Admiral Corporation, Schaumburg, Ill.

Filed May 2, 1977, Ser. No. 792,610

Int. Cl.[2] H04N *9/52, 9/537*

U.S. Cl. 358—29 **17 Claims**



1. In a transistor amplifier circuit, a transistor amplifier having a base element, a collector element and an emitter element, first and second potential sources, first and second impedance means for coupling, respectively, said first and second potential sources to said collector element, said first impedance means being variable whereby both the gain of said transistor amplifier and the DC voltage established at said collector element are controlled in proportion to the adjustment of said first impedance means.

5. In a color television receiver comprising:

a. a color CRT having first and second electron guns, each including a cathode element and an accelerating electrode;

b. first and second transistor amplifiers for first and second color channels, respectively, each of said first and second amplifiers having a base, an emitter and a collector;

c. first and second potential sources associated with each of said first and second transistor amplifiers;

d. second impedance means for coupling said second sources to said collectors of said first and second transistor amplifiers; and

e. first variable impedance means for coupling said first sources to said collectors of said first and second transistor amplifiers, said first variable impedance means being varied to control both the gain and the collector DC voltage of said first and second transistor amplifiers in proportion to the adjustment of said first variable impedance means.

4,112,461

MULTIWAVELENGTH LIGHT BEAM DEFLECTION AND MODULATION

James Carl Owens, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,622

Int. Cl.[2] H04N *9/14;* G02F *1/33*

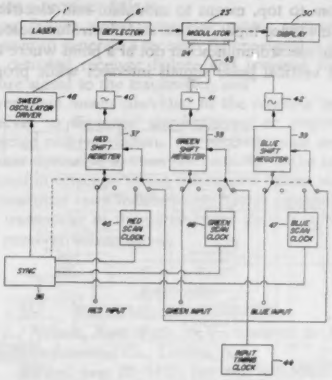
U.S. Cl. 358—63 **12 Claims**

1. Apparatus for diffracting light of a plurality of different selected optical wavelengths including a first wavelength and at least one other wavelength longer than said first wavelength, said apparatus diffracting the light into a plurality of respectively different wavelength beams such that the diffracted light beams scan the same angular range with no more than a predetermined maximum variation of the light intensity, said apparatus comprising:

an acoustooptic deflector cell in the path of the light;

means for generating variable frequency acoustic waves in said cell;

means for selectively activating the light of said first wavelength only during those times during which said variable frequency is within a range which will result in no more than said predetermined maximum light intensity variation, and for selectively activating the light of said other wavelengths only during those times during which said variable frequency is within a range which will result in angular diffraction ranges which will match the angular diffraction range of the diffracted light of said first wavelength when activated.



4,112,462

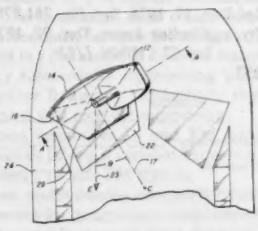
INFINITY IMAGE DISPLAY HAVING INCREASED VERTICAL FIELD OF VIEW

ichard A. Mecklenborg, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,004

Int. Cl.² H04N 7/18

J.S. Cl. 358—104 **23 Claims**



1. A method for increasing the field of view of a displayed image provided by an image source-spherical mirror-beam-splitter display to an observer whose eyepoint is normally located near the center of curvature of said mirror, said display being operable to transform an input image from the image source into a displayed image that appears to be at infinity to said observer, comprising the steps of:

shifting the mirror's center of curvature laterally and rearwardly with respect to the observer's eyepoint; and

displacing the input image to correct any heading error of the displayed image produced by the shifting step.

4,112,463

SYSTEM FOR DETECTING A MOTION IN THE MONITORING AREA OF TWO OR MORE TELEVISION CAMERAS

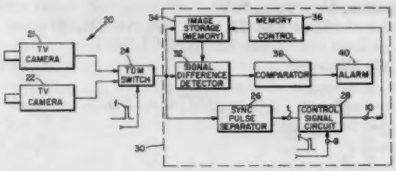
Gerhard Robert Kamin, Traisa, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 31, 1977, Ser. No. 783,322

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613706

Int. Cl.² H04N 5/22, 7/18

U.S. Cl. 358—105 **6 Claims**



1. A control circuit adapted to be connected in a plural-camera television monitoring system and comprising an input terminal for receiving time-division multiplexed synchronizing signals that are separated from the video signals of a plurality of television monitoring cameras in said system, first means connected to said input terminal for separating from the time-division multiplexed synchronizing signals only the alternatively occurring ones of the vertical signal portions that occur at the beginning of a preselected one of the odd and even video signal picture fields, and second means connected to said first means for deriving a pulse from each separated vertical signal portion to mark the beginning of said pre-selected one of said fields.

4,112,464

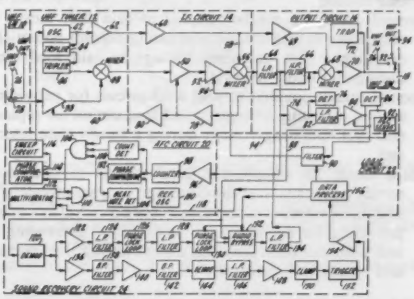
SUBSCRIPTION TV DECODER LOGIC SYSTEM

Stanley E. Guif; Terry L. Nimmer; Donald A. Weigt, all of Madison; Glenn Wolenec, Cross Plains, and Richard C. Gall, Middleton, all of Wis., assignors to Oak Industries Inc., Crystal Lake, Ill.

Filed May 11, 1977, Ser. No. 795,765

Int. Cl.² H04N 7/16

U.S. Cl. 358—122 **9 Claims**



9. A subscription TV decoder for processing encoded audio and video signals in which the decoder enabling signal has address and data portions thereof, including audio and video decoder circuits and a decoder enabling circuit connected thereto, said enabling circuit including address storage means, means for comparing the address portion of a received message with the stored address, means responsive to said comparing means for storing the data portion of a message including a plurality of temporary storage elements, means for comparing the data stored in said elements and a further storage element for storing said data when the data in said temporary storage

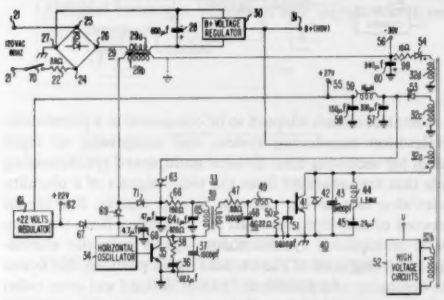
elements is the same, means responsive to a subsequently received enabling message having an address common to a plurality of subscribers for comparing the stored data with the enabling message data, and enabling means responsive to said last-named comparison means for enabling said audio and video decoder circuits.

4,112,465

THRUSH CURRENT START-UP CIRCUIT FOR A TELEVISION RECEIVER INCLUDING A START-UP DECOUPLING CIRCUIT

Donald Henry Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,693
Int. Cl.[2] H04N *3/18*
U.S. Cl. 358—190 **10 Claims**



1. A start-up power supply, comprising:

first rectifying means responsive to a source of first alternating current potential for providing a pulsating direct current voltage;

filter means coupled to said first rectifying means for providing a first direct current voltage and in which an inrush current flows during an initial interval;

a first inductor coupled to said filter means in which said inrush current flows;

first means coupled to said first inductor and responsive to said inrush current for developing a second alternating current potential during said initial interval;

a load circuit;

second rectifying means coupled to said first means and responsive to said second alternating current potential for coupling a first operating voltage to said load circuit during said initial interval;

second means coupled to said load circuit for providing a second operating voltage to said load circuit for replacing said first operating voltage during a steady state interval; and

third means for coupling a third voltage to said second rectifying means, said third voltage varying in value from said initial interval to said steady state interval in a manner providing for decoupling of said second alternating current potential from said load circuit during the entirety of said steady state interval.

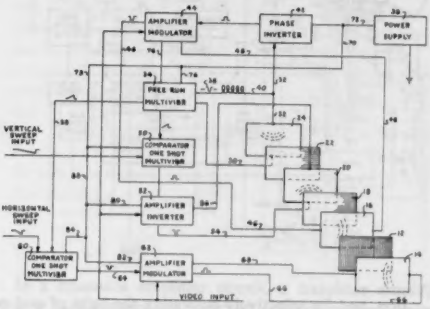
4,112,466

FLAT TELEVISION SCREEN

Donald J. Bendiks, 1020 W. Water St., New Buffalo, Mich. 49117

Filed Jun. 11, 1976, Ser. No. 695,023
Int. Cl.[2] H04N *3/14*
U.S. Cl. 358—241 **2 Claims**

1. A television apparatus comprising: a plurality of sheets in planular juxtaposition, at least one of said sheets being an electroluminescent sheet, and other of said sheets being electroconductive sheets and electrically resistant sheets, means responsive to a horizontal sweep input to apply electrical pulse signals to propagate horizontally through two of said electroconductive sheets so that in one sheet the electrical pulse signals propagate from left to right and in the other from right to left, means responsive to a vertical sweep input to apply electrical pulse signals to propogate vertically through two of said electroconductive sheets so that in one sheet the electrical pulse signals propagate from top to bottom and in the other from bottom to top, means to modulate said electrical pulse signals with a video input, so that said electroluminescent sheet produces an electroluminescent dot at a point where the horizontal and vertical pulse signals intersect while propagating



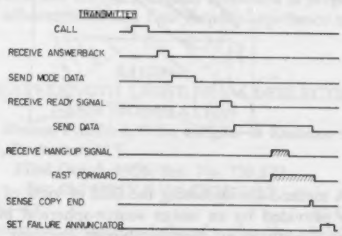
through the electroconductive sheets, said electroluminescent sheet being interposed between two of said electroconductive sheets, and an electrically resistant sheet being interposed between each of the remaining planular juxtaposed electroconductive sheets, said sheets having an order from first to last, one of said electroconductive sheets for horizontal signals, said electroluminescent sheet, the other electroconductive sheet for horizontal signals, an electrically resistant sheet, one of said electroconductive sheets for vertical signals, another electrically resistant sheet, and the other electroconductive sheet for vertical signals.

4,112,467

FAILURE MODE CONTROL APPARATUS FOR ELECTRONIC GRAPHIC DATA TRANSMISSION SYSTEM

Mutsuo Ogawa, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1976, Ser. No. 751,878
Claims priority, application Japan, Dec. 30, 1975, 50/158565
Int. Cl.[2] H04N *1/32*
U.S. Cl. 358—257 **7 Claims**



1. In an electronic data transmission system including a transmitter and a receiver, a failure mode control apparatus comprising:

transmitter failure sensing means provided to the transmitter to detect a transmitter failure;

transmitter failure signal generator means provided to the

transmitter to generate a transmitter failure signal in response to the detected transmitter failure and transmit the transmitter failure signal to the receiver;

transmitter reset means provided to the transmitter to reset the transmitter to an initial status thereof in response to the detected transmitter failure;

receiver failure sensing means provided to the receiver to detect a receiver failure;

receiver failure signal generator means provided to the receiver to generate a receiver failure signal in response to the detected receiver failure and transmit the receiver failure signal to the transmitter; and

receiver reset means provided to the receiver to reset the receiver to an initial status thereof in response to the detected receiver failure, the receiver reset means being further operative to reset the receiver to the initial status thereof in response to the transmitter failure signals;

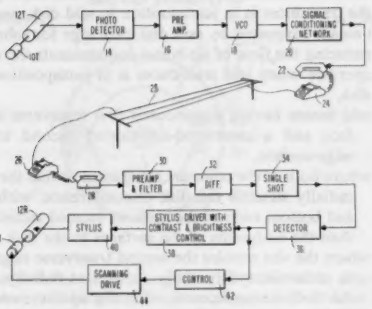
the transmitter reset means being further operative to reset the transmitter to the initial status thereof in response to the receiver failure signal.

4,112,468

FACSIMILE RECEIVER

Richard L. Nelson, New York, N.Y., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 21, 1975, Ser. No. 606,506
Int. Cl.[2] H04B *1/02, 1/22*
U.S. Cl. 358—280 **6 Claims**



1. A facsimile receiver for producing a copy at a receiving location in response to FM signals transmitted over conventional voice communication lines where said FM signals lie within a predetermined facsimie facsimile and represent light-dark variations in a document at a remote transmitting location one frequency substantially representing white on the document and another frequency substantially representing black on the document said receiver comprising:

trigger means responsive to said FM signals to generate trigger signals having a variable frequency proportional to the frequency of said FM signals;

a single-shot multivibrator coupled to the output of said trigger means for generating a multivibrator output signal having an astable state of fixed duration initiated in response to said trigger signals, the ratio of the astable state duration to the period of the multivibrator cycle being directly proportional to the frequency of said trigger signals;

detecting means coupled to the output of said single-shot multivibrator for detecting the ratio of said astable state duration to the period of the multivibrator cycle in generating a control signal representing said ratio;

a stylus drive circuit coupled to the output of said detecting means and responsive to said control signal said stylus drive circuit comprising a transistor having a base terminal coupled to the output of said detecting means;

a stylus coupled to the output of said stylus drive circuit for marking a copy medium to reproduce light-dark variations in said document;

scanning means for moving said stylus relative to said copy medium; and

control means having an input connected to the output of said detecting means and an output connected to the input of said scanning means for deactivating said scanning means when the ratio of said astable state duration to the period of the multivibrator cycle falls below a predetermined level indicating a poor signal quality transmission or loss of signal from the remote transmitting location;

the improvement comprising:

filter means coupled to the input of said trigger means for passing FM signals in the facsimile band while substantially attenuating noise signals outside said band so as to substantially preclude the erroneous interruption of said scanning by said control means in response to noise signals while the receiver is receiving FM signals in the facsimile band while at the same time improving the quality of the facsimile; and

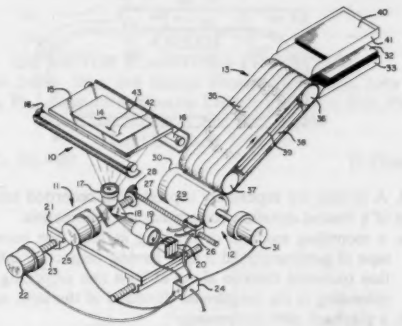
contrast control means comprising a potentiometer connected in the collector-emitter circuit of said transistor, said stylus also being connected to said collector-emitter circuit for adjusting the output of said drive circuit so as to control the contrast in the light-dark variations on said copy medium.

4,112,469

JET DROP COPYING APPARATUS

Suresh C. Paranjpe, and James E. Burnett, both of Xenia, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 21, 1977, Ser. No. 789,417
Int. Cl.[2] H04N *1/04, 1/22*
U.S. Cl. 358—296 **9 Claims**



1. Jet drop printing apparatus for copying or duplicating comprising:

Rotary support means for supporting a print receiving sheet,

Paper handling means for feeding said sheet to the rotary support means and removing the sheet therefrom,

Rotary drive means for causing rotary motion of the rotary support means,

A print head including an orifice plate provided with a series of orifices defining an array of jet printing nozzles for generating an array of parallel jets to print a series of non-contiguous tracks of image information on a sheet mounted as aforesaid on the rotary support means and rotated therewith,

Advancing means for advancing said array of jets in a direction parallel to the axis of said rotary motion and at a speed for interlacing said tracks to produce a solid coverage print,

Flat bed document support means for supporting a document to be copied,

Illuminating means for illuminating said document,

Collimating means for collimating light reflected by said document,

A rotating mirror assembly for variable angular deflection of said collimated light in correspondence with the rotation of the rotary support means,

A focusing lens for focusing said collimated and angularly deflected light to create an image of at least a part of said document,

An array of photosensing elements arranged in like manner as said jet printing nozzles and positioned at the image plane of the focusing lens,

Transport means for transporting said photosensing elements, said focusing lens, said mirror assembly, and said collimating means in a direction parallel to the axis of rotation of the mirror assembly and in synchronism with aforesaid axial advancing of said nozzle array,

Print control means responsive to the photosensing elements for controlling the operation of said nozzles, and

Means for initiating removal of the print receiving sheet from the rotary support means by the paper handling means.

4,112,470

SYSTEM FOR REPEATEDLY REPRODUCING A RECORDED MATERIAL OF A LIMITED DURATION

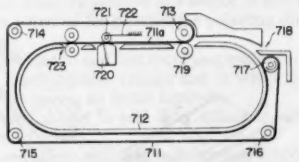
Satoshi Yamauchi, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1976, Ser. No. 655,574

Claims priority, application Japan, Feb. 6, 1975, 50-15783

Int. Cl.[2] G11B *15/26;* **G06K** *13/18, 13/24*

U.S. Cl. 360—88 **17 Claims**



1. A system for repeatedly reproducing recorded information of a limited duration comprising in combination:

a. a recording medium comprising at least one recording tape of predetermined length having respective information recorded thereon along at least one recording track extending in the lengthwise direction of the tape; and

b. a playback unit comprising:

i. means defining a circulating path for accommodating said tape for circulating therethrough, said path having a length longer than the tape length and an inlet for the tape;

ii. means for continuously circulating the tape entered from said inlet around said path in one direction, said circulating means comprising: a stationary member disposed along the inside of said circulating path and having its outer surface finished smoothly; a plurality of rollers; and an endless belt entrained around said plurality of rollers and having a run which is maintained in sliding contact with the outer surface of said stationary member and serves as a driving means for the tape through the frictional engagement of one surface thereof with the tape, at least one of said rollers serving as a drive roller;

iii. means disposed along said path for picking up the information recorded on the circulating tape;

iv. means for reproducing the picked up information; and

v. means for optionally diverting the circulating tape out of said path to deliver the same outside the unit.

4,112,471

DISK CARTRIDGE CONTAMINATION SHIELD

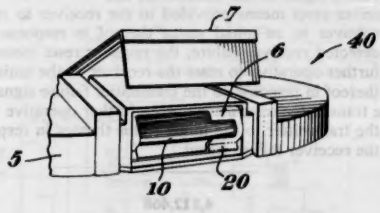
Christopher A. Pollard, Kinnesswood, and David Stiven, Kirkcaldy, both of Scotland, assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 4, 1976, Ser. No. 729,532

Claims priority, application United Kingdom, Mar. 2, 1976, 8218/76

Int. Cl.[2] G11B *23/02, 25/04, 5/012*

U.S. Cl. 360—98 **10 Claims**



1. In an information storage apparatus having a rotatable memory disk and a disk drive unit including a transducer, a housing positionable within the apparatus comprising:

(a) a disk cartridge containing a disk, said disk cartridge having an aperture formed therein to permit the transducer to be juxtaposed to said disk, said aperture allowing air-borne contaminants to flow freely therethrough when the transducer is in juxtaposition to said disk, and

(b) means supported by said disk cartridge for substantially reducing the flow of air-borne contaminants through said aperture when said transducer is in juxtaposition to said disk,

said means having a contoured first transverse edge-surface and a contoured-and-slotted second transverse edge-surface,

where both of the contours are shaped so that the surfaces radially straddle the disk circumference, with the top and bottom ends of the surfaces located radially closer than the midpoints of the surfaces to the disk axis, and

where the slot enables the second transverse edge-surface to cross-circumferentially, as well as radially, straddle the disk circumference, with the aperture-end of the surface located radially closer than the cartridge-end of the surface to the disk axis.

4,112,472

LONGITUDINAL SCAN, CAM SHAPED, TURNTABLE ROTOR FOR MAGNETIC RECORDING

Francis Edward Hauke, Boulder; Everette Ray McCully, Erie, both of Colo.; Robert Marion McElroy, Jr., Huntsville, Ala.; Peter Alan Stevenson; Stephen Martin Vogel, both of Boulder, Colo., and John Walton Woods, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,892

Int. Cl.[2] G11B *15/64, 15/60, 21/04*

U.S. Cl. 360—102 **7 Claims**

1. A longitudinally scanned recording device comprising in combination:

a length of media positioned in a first plane;

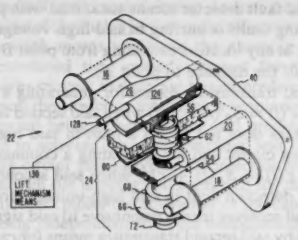
a turntable rotor, said turntable rotor having an axis of rotation substantially perpendicular to the first plane and a transducing surface thereon with an apex, and a sloping profile facing the media;

transducing means being operably positioned on the apex of said transducing surface;

transporting means operable to transport said media past the transducing means;

drive means operable to rotate said transducing means relative to said media whereby an air film is being developed

between the transducing means and the media thereby enabling the media to fly relative to the transducing means



as data is being transduced into arcuate tracks on said media.

4,112,473

APPARATUS FOR DETERMINING A D-C POTENTIAL IN METAL-ENCAPSULATED HIGH VOLTAGE SWITCHING INSTALLATIONS AND EQUIPMENTS

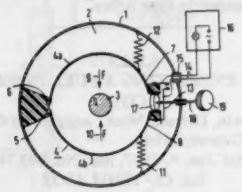
Willi Olsen, and Christian Pircher, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 16, 1976, Ser. No. 742,222

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1975, 2552381

Int. Cl.[2] H02H *1/00*

U.S. Cl. 361—1 **6 Claims**



1. Apparatus for determining the d-c potential in a metal-encapsulated switching installation equipped with at least one high-voltage conductor supported by insulators within a grounded encapsulation, the apparatus comprising:

a measuring device including:

a first means responsive to the charge on said conductor, said first means including a hollow cylinder surrounding said conductor and spaced therefrom by an insulated space, said hollow cylinder being split along its axis to form two pivotably supported half-shells;

and a second means responsive to said first means for delivering a signal when said d-c potential is present, said second means including a switching device responsive to said cylinder.

4,112,474

CAPACITOR PROTECTIVE DEVICE

S. R. Wilson, Glens Falls, and D. B. Jones, Hudson Falls, both of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Filed Jan. 27, 1977, Ser. No. 763,089

Int. Cl.[2] H02H *7/16*

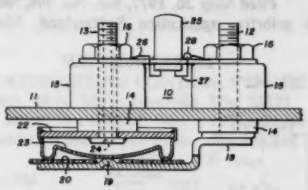
U.S. Cl. 361—15 **7 Claims**

1. In combination with an electrical capacitor, a safety device comprising

a. an electrical switch means having a pair of electrical terminals projecting from said capacitor and adapted to be connected to a source of electrical power other than the power source connecting said capacitor,

b. a pressure sensitive element connected to said switch means and adapted to sense a pressure rise in said capacitor,

c. normally closed electrical contact means connected to said pressure sensitive element and adapted to be opened by a pressure increase in said capacitor,



d. said contacts in their closed position providing an electrical circuit from one of said terminals through said contacts to the other of said terminals,

e. an indicating means electrically connected across said terminals and in shunt with said circuit said indicating means being adapted not to be energized when said switch contacts are in their closed position.

4,112,475

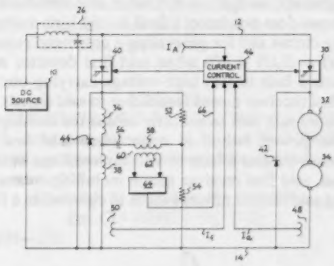
D-C MOTOR FLASHOVER PROTECTION

Thomas Detlor Stitt, and Dennis Francis Williamson, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Dec. 22, 1976, Ser. No. 753,406

Int. Cl.[2] H02H *7/09*

U.S. Cl. 361—33 **10 Claims**



1. A protection system for a direct current electric traction motor, said motor having armature and field means adapted for receiving direct current electric power from a direct current power source, said system comprising:

a. regulating means interconnecting said motor current path;

b. detection means connected for monitoring the polarity and magnitude of voltage on said field means, said detection means being responsive to rapid reversal of said polarity for producing a flashover signal; and

c. means coupling said flashover signal to said regulating means, said regulating means being responsive to said flashover signal for interrupting said motor current path.

4,112,476
GROUND FAULT PROTECTION SYSTEM

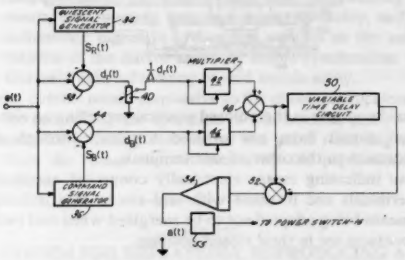
Hans Benninger, Nussbaumen; Fritz Eggimann, Zurich, and Ole Enkegaard, Gebenstorf, all of Switzerland, assignors to Patelhold Patentverwertungs & Elektro-Holding AG, Glarus, Switzerland

Filed May 20, 1977, Ser. No. 798,760

Claims priority, application Switzerland, May 25, 1976, 6565/76

Int. Cl.² H02H 7/26

U.S. Cl. 361—42 **7 Claims**



1. A ground fault protection system for monitoring a circuit carrying high-voltage between two points A and B and for disconnecting said circuit from the remainder of a high-voltage network when a fault is detected in said circuit, said system comprising:

(a) first and second power switches for disconnecting points A and B, respectively, from the remainder of a high-voltage network when a fault is detected in said circuit;

(B) first detection circuit means for detecting faults occurring in said high-voltage carrying circuit at any location extending from point A to at least one-half the distance to point B and for opening said first and second power switches when a fault is detected, said first detection circuit means comprising:

(1) first fault detector means associated with point A for detecting faults occurring in said high-voltage carrying circuit at any location extending from point A to at least one-half the distance to point B;

(2) first transmission means for generating a quiescent signal $e(t) = S_R(t) + r(t)$ when said first fault detector means does not detect a fault in said high-voltage carrying circuit and for generating a command release signal $e(t) = S_B(t) + r(t)$ when said first detector means detects a fault in said high-voltage carrying circuit;

(3) first receiver means responsive to said signals transmitted by said first transmitter means for causing said second power switch to open when said first detector means detects a fault in said high-voltage carrying circuit, said first receiver means including means for causing said second power switch to open when a first signal

$$w_R = \frac{1}{\Lambda^2} \int_{t-T}^{t} [e(\tau) - S_R(\tau)]^2 \, d\tau$$

is greater than a second signal

$$w_B = \int_{t-T}^{t} [e(\tau) - S_B(\tau)]^2 \, d\tau$$

wherein Λ is an adjustable factor greater than zero and T is a determinable time delay;

(C) second detection circuit means for detecting faults occurring in said high voltage carrying circuit at any location extending from point B to at least one-half the distance to point A and for opening said first and second power switches when a fault is detected, said first detection circuit means comprising:

(1) second fault detector means associated with point B for detecting faults occurring in said high voltage carrying circuit at any location extending from point B to at least one-half the distance to point A;

(2) second transmission means for generating a quiescent signal $e'(t) = S_R'(t) + r'(t)$ when said second fault detector means does not detect a fault in said high voltage carrying circuit and for generating a command release signal $e'(t) = S_B'(t) + r'(t)$ when said second detector means detects a fault in said high-voltage circuit;

(3) second receiver means responsive to said signals transmitted by said second transmitter means for causing said first power switch to open when said second detector means detects a fault in said high-voltage carrying circuit, said second receiver means including means for causing said first power switch to open when a first signal

$$w_R' = \frac{1}{2} \int_{t-T}^{t} [e'(\tau) - S_R'(\tau)]^2 \, d\tau$$

is greater than a second signal

$$w_B' = \int_{t-T}^{t} [e'(\tau) - S_B'(\tau)]^2 \, d\tau$$

wherein Λ is an adjustable factor greater than zero and T is a determinable time delay.

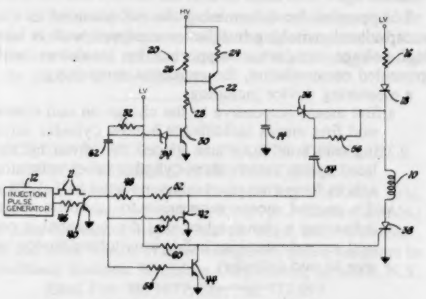
4,112,477
CIRCUIT FOR ENERGIZING A FUEL INJECTOR VALVE COIL

Walter M. Sherwin, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 6, 1977, Ser. No. 803,744

Int. Cl.² H01H 47/32

U.S. Cl. 361—155 **3 Claims**



1. A circuit for energizing a fuel injector valve coil in response to fuel injection pulses to provide measured amounts of fuel to an internal combustion engine, the circuit comprising:

a storage capacitor;

a charging circuit including a relatively high voltage source and a first switch means in series effective to charge the storage capacitor;

a capacitor discharge circuit, the discharge circuit including a second switch means responsive to the initiation of a fuel injection pulse effective to discharge the capacitor through the injector valve coil to affect abrupt injection valve opening and also effective to terminate capacitor discharge when the capacitor discharge current decreases

to a predetermined value which is reached after valve opening occurs;

means including a reactive timing element responsive to the initiation of the fuel injection pulse effective to control the first switch means to disable the charging circuit for a predetermined time period required for the capacitor discharge current to decrease to said predetermined value at which the capacitor discharge is terminated, the charging circuit being effective after said predetermined time period to activate capacitor charging; and

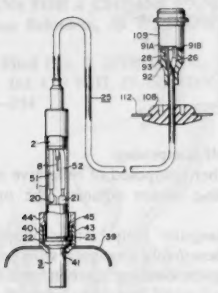
a holding circuit responsive to the injection pulse effective to maintain the injector coil energized for the duration of the injection pulse, the activation of the capacitor charging being independent from the energization of the injector coil by the holding circuit so that the capacitor charges for a time independent from the duration of the injection pulses.

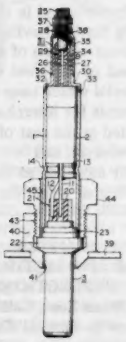
4,112,478

HIGH-TEMPERATURE DETECTING APPARATUS

Toru Takahasi, Mito; Sadayasu Ueno, and Tomoji Inui, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 23, 1977, Ser. No. 780,328
Claims priority, application Japan, Mar. 24, 1976, 51-31253
Int. Cl.² H01N *35/00*
U.S. Cl. 361—162 **8 Claims**





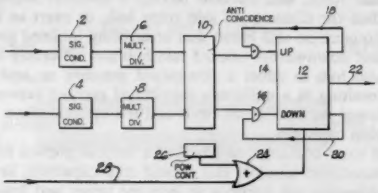
1. A high-temperature detecting apparatus comprising a thermocouple capable of generating an electromotive force by a temperature difference between the hot and cold junctions thereof, an electromagnetic coil, a reed switch disposed within said electromagnetic coil, first connecting means for connecting said electromagnetic coil to said cold junctions of said thermocouple thereby to form a closed loop, lead means for taking out an electrical signal indicative of the operation of the contacts of said reed switch, said electromagnetic coil being excited thereby to actuate said reed switch in response to an increase in the temperature difference between said hot and cold junctions of said thermocouple, said actuation being transmitted outside by said lead means; said apparatus further comprising casing means, means for fixing said thermocouple to said casing means, means for fixing said reed switch and said electromagnetic coil to said casing means, and means for fixing the reed switch side terminal of said lead means to said casing means.

4,112,479

SYNCHRONIZING CONTROL SYSTEM

Robert I. White, 20 N. Main, Deerfield, Wis. 53531

Continuation of Ser. No. 422,961, Dec. 7, 1973, abandoned. This application Jan. 24, 1977, Ser. No. 761,791
Int. Cl.² H01H *47/00*
U.S. Cl. 361—243 **4 Claims**



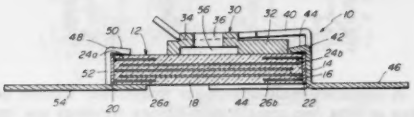
1. In a speed synchronizing system comprising means for receiving master synchronizing periodic signals and means for receiving periodic pulses representative of the speed of a device to be synchronized with the master synchronizing pulses, the improvement comprising: an up/down counter having a plurality of counting states and an up count input terminal and down count input terminal; means for deriving an output from said counter based upon the count stored in said counter so as to establish a threshold value; means for supplying the master synchronizing periodic signals to one input terminal; means for supplying the speed representative synchronizing periodic pulses of the slave to the other input terminal whereby a first output is derived from said counter when the count stored in said counter is less than the threshold value and a second and different output is provided when the count stored in said counter is more than threshold value; means for connecting the output to the device to control the speed thereof; and including means for inhibiting master or slave representative pulses to said up/down counter when said counter is counted to either its upper or lower limit, respectively.

4,112,480

TUNABLE EXTENDED RANGE CHIP CAPACITOR

Norman E. Johanson, Boonton, N.J., and Emil Seidler, Burbank, Calif., assignors to Johanson Manufacturing Corporation, Boonton, N.J.

Filed Jul. 8, 1977, Ser. No. 814,059
Int. Cl.² H01G *5/06, 1/00*
U.S. Cl. 361—271 **3 Claims**



1. A tunable, extended range multilayered ceramic chip capacitor comprising:

a multilayered chip capacitor having upper and lower base surfaces and two metallized terminal ends, and having a fixed capacitance value;

a plurality of metallized electrode patterns embedded within said chip capacitor and oriented parallel to and in near

proximity to the upper and lower surfaces of said chip capacitor, as the upper and lower electrode layers therein;

said electrode patterns being symmetrically disposed with each pattern being in contact with one metallized terminal end of said chip capacitor and spaced apart from any other pattern in the same layer;

a metallic rotor having a central circular hub and a rotor blade emanating from said hub, the outer perimeter of said blade terminating short of one terminal end of said chip;

said rotor having a square opening in its hub for insertion of a tool bit to turn said rotor;

said rotor being centrally positioned over the upper surface of said chip capacitor such that the central hub of said rotor does not overlap an embedded electrode pattern in the upper electrode layer;

a rotor contact spring having two spaced apart, horizontally extending arms having circular cut-outs to grip the hub of said rotor, said cut-outs having a diameter slightly less than the diameter of said rotor hub, to exert an inward pressure on said rotor, said arms being inclined inwardly and downwardly toward said hub and upwardly beyond said hub to effect a downward pressure on said rotor, resulting in a uniformly distributed contact between the lower surface of said rotor and the upper surface of said chip capacitor;

said rotor contact spring having a vertical portion to grip a metallized terminal end of said chip capacitor, inwardly extending tab portions to grip the upper and lower surfaces of said chip capacitor, and an outwardly extending portion to serve as a terminal connection;

said rotor contact spring serving to anchor said rotor in position and provide an electrical connection to one terminal end of said chip;

a second spring clip having horizontal tabs to grip the upper and lower surfaces of the outer terminal end of said chip, a vertical portion to provide electrical connection to the metallized terminal end and an outward extending portion to provide a terminal contact; said second spring clip serving as a stator spring clip;

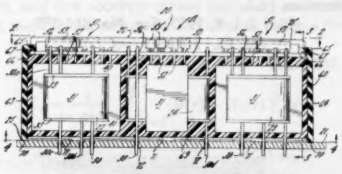
the range of said capacitor being extended and tunable by the rotation of said rotor blade over a portion of the electrode pattern connected to the terminal end opposite that to which said rotor is connected.

4,112,481

MINIATURE MULTI-IMPEDANCE TRANSFORMER MODULE

Ralph R. Roge, Lemont; Mark S. Ziermann, Bolingbrook, and Anthony J. Wilkis, Downers Grove, all of Ill., assignors to Wescom, Inc., Downers Grove, Ill.

Filed May 5, 1977, Ser. No. 793,942
Int. Cl.[2] H02B 1/18
U.S. Cl. 361—395 **7 Claims**



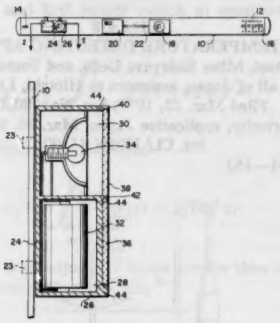
1. A miniature multi-impedance transformer module comprising at least two transformers having windings and impedance changing taps, connector pins mechanically connected to said transformers, at least some of the connector pins being electrically connected to respective ones of said windings and taps, at least some of the connector pins extending both above and below the transformers, a printed circuit board having apertures receiving the pins projecting above the transformers, selector means on the printed circuit board connected to at least some of the pins for selectively connecting said windings and taps to program the impedance characteristics of said module, a miniaturized enclosure having an open base for receiving the printed circuit board and transformers and an open top for allowing access to the selector means, means potting the printed circuit board and transformers in place in said enclosure with some of said pins extending below the transformers and projecting below said base for electrical and mechanical connection to a second printed circuit board.

4,112,482

NIGHT LIGHT BELT

Virgil Powell, 1111 Victoria St., Los Angeles, Calif. 90019

Filed May 9, 1977, Ser. No. 795,067
Int. Cl.[2] F21V 33/00
U.S. Cl. 362—108 **4 Claims**



1. A night light belt comprising:

an elongated member composed of reflective material having quick-coupling means adjacent the opposite ends thereof,

an elongated rectangular lamp-battery housing provided with clips for detachably engaging with said elongated member to hang the housing thereon, said housing normally hanging on said elongated member, said housing being divided into two separate side-by-side compartments in a plane parallel to said elongated member when hung thereon, one containing a battery for energizing a reflector lightbulb contained in the other, open compartment, said housing further having adjacent planar frames provided in the front of each of said compartments

two panes composed of different colored reflective light transmissible material which snap-fit into said front frames of said compartments for interchange with each other,

another lamp mounted at the rear of said elongated member when worn by a wearer, and

a battery-switch unit mounted at the left side of said elongated member when so worn, for operating said lamp.

4,112,483

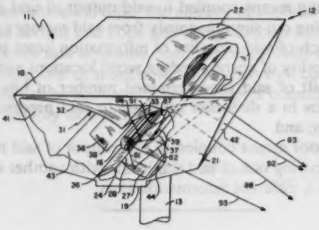
LIGHTING FIXTURE AND METHOD USING MULTIPLE REFLECTIONS

Edward A. Small, Jr., Santa Rosa, Calif., and Ian Lewin, Scottsdale, Ariz., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Continuation of Ser. No. 709,414, Jul. 28, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,691
Int. Cl.[2] F21V 7/00
U.S. Cl. 362—298 **14 Claims**

1. In a lighting fixture, a housing having an open side, a lamp mounted in the housing and producing rays of light, first and second reflecting surface carried by the housing for reflecting light from a lamp, said first and second reflecting surfaces being positioned on opposite sides of the lamp whereby direct rays of the lamp will strike the first reflecting surface and be

reflected onto the second reflecting surface and then will be reflected through the open side at a high angle in the vicinity of 70° and greater with respect to vertical, each of said first and second reflecting surfaces being formed of a metal layer and a



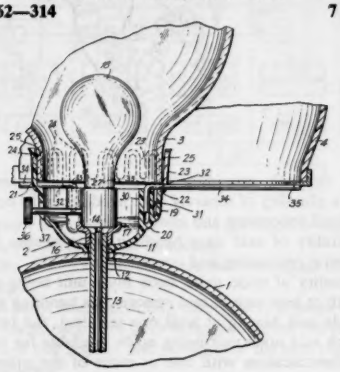
multi-layer high reflectivity coating carried on the metal layer, said multi-layer high reflectivity coating being formed of materials having high and low indices of - refraction to provide a reflectivity which does not fall below 95% for light at any angle.

4,112,484

CUP MEMBER FOR A LAMP HAVING SUPPORT MEANS FOR A CHIMNEY AND A SHADE

Steven William Schwartz, 38 W. Fourth St., Freeport, N.Y. 11520

Filed Oct. 8, 1976, Ser. No. 731,102
Int. Cl.² F21L *19/02;* F21V *17/00*
U.S. Cl. 362—314 **7 Claims**



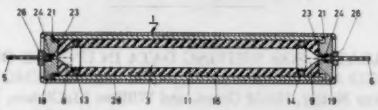
1. In a lamp construction having a base, a chimney, a bulb fixture, and a shade, an improvement comprising a cup member of plastic material detachably restable on the base for receiving the bulb fixture, said cup member including an upstanding annular rim having a plurality of spaced slots therein defining a plurality of upstanding flexible fingers between said slots for frictionally receiving the chimney, and a plurality of upstanding bushings integral with said cup member, said bushings being hollow and having upper ends disposed below the upper ends of said flexible fingers, said bushings being angularly disposed in alignment with selected of said slots, and a plurality of rods having bent ends removably engaged in said bushings, said rods extending from said bent ends in the bushings through the aligned slots radially outwards from the cup member, said rods having ends remote from said cup member for supporting said shade, said cup member comprising a lower dome portion which rests on said base in inverted fahion, a cylindrical portion extending upwardly from said dome portion and having a larger diameter than said dome portion with a step formed between said dome portion and said cylindrical portion, said rim extending upwardly from said cylindrical portion and having a larger diameter than said cylindrical portion with a second step between the rim and the cylindrical portion, said bushings extending upwardly from said dome portion to a spaced location inwards of said cylindrical portion, said upper ends of the bushings being disposed at a level below the slots, said selected slots for the passage of the rods extending in the rim to the level of said second step, the other slots extending less deeply in the rim to define a lower circumferential band above said second step joining said fingers to said second step.

4,112,485

IMPACT RESISTANT EXPLOSION PROOF LAMP COMPRISING ENCAPSULATED LIGHT SOURCE

Aldo Sutter, im Berghof 1, 8700 Kusnacht, Switzerland

Filed May 3, 1976, Ser. No. 682,754
Claims priority, application Switzerland, May 9, 1975, 5940/75
Int. Cl.² F21V *15/04*
U.S. Cl. 362—369 **18 Claims**



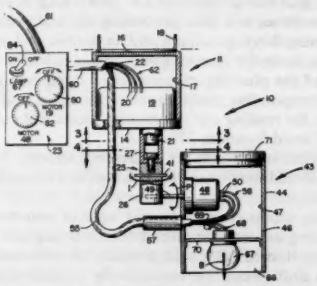
1. A fluid-tight self-cooling impact-resistant electric lamp comprising: a light source, and a multilayered casing having a translucent region and in which said light source is entirely embedded, said casing completely enveloping and in contact with said light source in sealed relationship for inhibiting transmission of shock forces to said light source, said multilayered casing comprising at least two layers of material, namely, an inner layer of material and an outer layer of material, with one layer of material being relatively more resilient thatn the other layer of material, and wherein said inner layer of material completely and seamlessly surrounds and is in contact with said light source and wherein said outer layer of material completely surrounds and is in contact with said inner layer of material, said inner layer of material adhering to said light source for maximum attenuation of induced oscillations resulting from said shock forces.

4,112,486

REMOTELY CONTROLLED POSITIONING DEVICE FOR ILLUMINATING UNIT AND THE LIKE

Murray Tovi, New York, N.Y., assignor to Murray Tovi Designs, Inc., New York, N.Y.

Filed May 26, 1976, Ser. No. 690,288
Int. Cl.² F21M *3/18;* F21S *3/02, 1/02*
U.S. Cl. 362—419 **23 Claims**



11. A remotely controlled illuminating device comprising, in

combination: a fixed driving unit including a first motor having a first rotatable shaft extending therefrom; a light unit including a second motor having a second rotatable shaft extending therefrom; mounting means for mounting said light unit on said driving unit, said mounting means coupling the end of said first shaft extending from said fixed driving unit directly to the end of said second shaft extending from said light unit in a substantially right angle relationship so that said first shaft, said mounting means and said second shaft define an "L" connection; illuminating means mounted in said light unit; means for actuating said illuminating means for directing a beam of light out of said light unit; means for actuating said first motor for rotating said light unit about the axis of said first shaft; means for actuating said second motor for rotating said light unit about the axis of said second shaft; first stop means for limiting the rotation of said light unit about said first shaft to less than 360°; and second stop means for limiting the rotation of said light unit about said second shaft to less than 360°; wherein said means for actuating said second motor and said illuminating means includes flexible continuous electrically conductive cables extending from said fixed driving unit to said light unit.

4,112,487

APPARATUS FOR WRITING DATA IN UNIQUE ORDER INTO AND RETRIEVING SAME FROM MEMORY

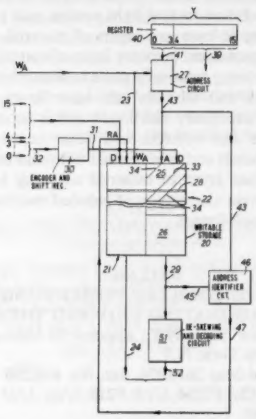
Geoffrey Nutter, Heald Green, and William McGibbon, Levenshulme, both of England, assignors to Ferranti Limited, Hollinwood, England

Filed Nov. 16, 1976, Ser. No. 742,230

Claims priority, application United Kingdom, Nov. 21, 1975, 47988/75

Int. Cl.² G06F *7/04*

U.S. Cl. 364—200 **1 Claim**



1. Data processing appartus for processing a plurality of information items, said data processing apparatus comprising:

a. a memory having an input and an output, and operable in a write mode for receiving and storing at least a portion of each of the plurality of information items into a plurality of corresponding multi-bit word locations and in a read mode, for reading out information items from said plurality of word location;

b. an addressing circuit for addressing selected word locations of said memory in both the write and read modes of operation;

c. loading means coupled to said input of said memory and including an encoder circuit for receiving and encoding said portion of each said plurality of information items, and a shift circuit for successively imparting to said encoded portion of each of said plurality of information items a shift of a predetermined number of bits in a predetermined direction, whereby said encoded portion of each of said plurality of information items is stored into a separate multi-bit word location as determined by said address circuit in a manner that one of said stored information items has a sequence of bits arranged in order different from that order of any other stored information item;

d. translating means coupled to said output of said memory for reading out simultaneously from said memory a single bit of each of said plurality of information items stored in said plurality of corresponding word locations and applying a shift of said predetermined number of bits to said single bits in a direction reversed to said predetermined direction; and

e. comparator means coupled to said output of said memory for comparing one of said single bits with another selected bit from a different information item.

4,112,488

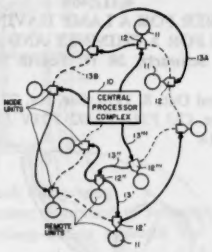
FAULT-TOLERANT NETWORK WITH NODE BRANCHING

Thomas Basil Smith, III, Sudbury, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 7, 1975, Ser. No. 556,086

Int. Cl.² G06F *3/00, 11/00;* H04L *5/00*

U.S. Cl. 364—200 **13 Claims**



1. A network providing for digital data communication among a plurality of separate data handling units comprising

a central processing and control unit;

a plurality of said data handling units remote from said central processing and control unit;

a plurality of node units, each node unit being associated with at least one of said remote data handling units, each node unit having at least one terminal, the terminals of each said node unit being made available for connective communication with one or more of the others of said node units or with said central processing and control unit;

a plurality of duplex communication links for interconnecting said node units with each other and with said central unit;

means for activating a selected number of said communication links, one end of each said activated link being designated as an inboard side of said link and the other end thereof being designated as an outboard side of said link;

means for selectively assigning an inboard status to terminals of said node units connected to an outboard side of an activated communication link, an outboard status to terminals of said node units connected to an inboard side of an acitvated communication link, and an inactive status to terminals connected to a non-activated communication link; and

means for effecting outbound communication channels from said central processing and control unit to selected node units, which channels traverse said links from inboard sides to outboard sides, and inbound communication channels in the reverse direction and for effecting outboard and inboard communication channels which traverse said links between selected node units for providing an inter-

connected network configuration in which each node unit and the at least one remote data handling unit associated therewith are in duplex communication with said central processing and control unit through a unique non-loop forming path comprising at least some of said activated communication links, the number of terminals made available at each said node unit being selected so that, if one or more of said activated communication links become inoperative, one or more of said non-activated communication links can be activated and said duplex communication can be reliably maintained.

4,112,489

DATA PROCESSING SYSTEMS

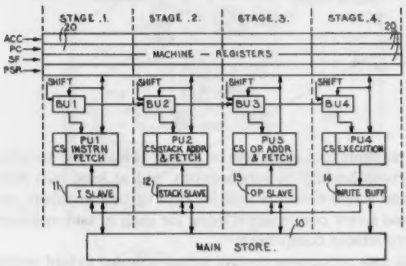
Keith William Wood, Manchester, England, assignor to International Computers Limited, London, England

Filed Feb. 4, 1977, Ser. No. 765,872

Claims priority, application United Kingdom, Feb. 6, 1976, 04684/76

Int. Cl.² G06F *7/00*

U.S. Cl. 364—200 **7 Claims**



1. A register arrangement for use in a pipelined data processing system, the arrangement including;

a plurality of information registers each having an input and an output;

first shift paths interconnecting the registers in series to form a sequence, each shift path being connected between the output of one register and the input of the next register in the sequence;

separate marker registration means associated respectively with each of the registers settable to indicate validity of information contained in the associated register;

second shift paths interconnecting the marker registration means into a sequence corresponding to that of the registers;

an output path corresponding to each register;

output control means for each output path responsive to setting of the marker registration means associated with the corresponding register to apply to the output path information contained within that register if the marker registration means is set to indicate validity of that information and otherwise to apply to the output path information from the first succeeding register, if any, of the sequence whose associated marker registration means is set; and

shift control means to generate shift control signals, the information registers and marker registration means being responsive to the shift control signals to shift their contents over the first and second shift paths respectively in synchronism each into the next succeeding register and registration means respectively of the sequence.

4,112,490

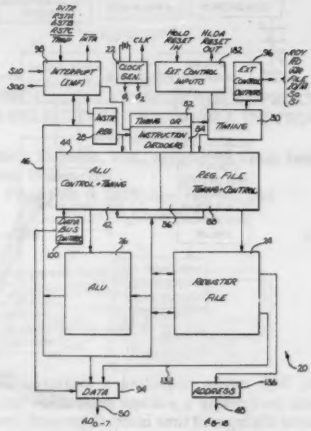
DATA TRANSFER CONTROL APPARATUS AND METHOD

William B. Pohlman, Los Gatos, and Andrew M. Volk, Santa Clara, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Nov. 24, 1976, Ser. No. 744,469

Int. Cl.² G06F *3/00*

U.S. Cl. 364—200 **11 Claims**



1. An apparatus for bidirectionally transferring digital information, such as words and bytes of addresses, codes and data, in a plurality of transfer modes, said apparatus being connected to a plurality of peripheral devices, said apparatus and plurality of peripheral devices being coupled by an external control bus and an external address and data bus, said apparatus coupled with first means, said first means for selectively processing digital information in response to a progammable set of instructions collectively denoted as a program and for employing a plurality of internal control signsals to control said apparatus with respect to said bidirectional transferring of digital information, said apparatus comprising:

means for multiplexing digital information on at least part of said external address and data bus to and from said first means, said multiplexing means being coupled to said first means and to said external address and data bus; and

means for generating and receiving a plurality of external bus control signals being connected to said external control bus encoded for communicating with said peripheral devices the availability of at least part of said address and data bus for transfer of digital information according to one of said plurality of transfer modes, said generating and receiving means being coupled to said first means,

whereby said apparatus is characterized by simplified control of said address and data bus in that the number of connections devoted to addressing and data transfers is reduced by the multiplexing of said digital information on said external address and data bus.

4,112,491

DIRECT READOUT REAL TIME PHYSIOLOGICAL PARAMETER ANALOG COMPUTER

Al Bugay, Canaan, N.H., assignor to Life Sciences, Inc., Greenwich, Conn.

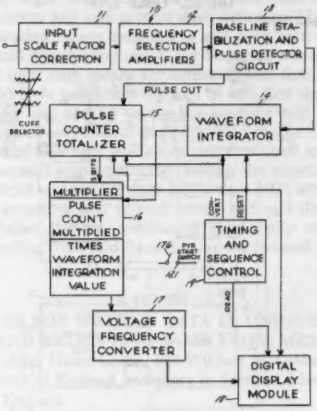
Filed Jul. 5, 1977, Ser. No. 812,752

Int. Cl.² A61B *5/04*; G06F *15/20*

U.S. Cl. 364—415 **3 Claims**

1. An improved physiological parameter analog computer for displaying components of measured pulsatile flow comprising: first means receiving a pulsatile wave form signal repre-

senting said flow; second frequency selection amplifier means passing frequency components of said signal above a predetermined frequency level; third means stabilizing signals received from said second means relative to a known baseline reference voltage; fourth means detecting each pulsatile impluse wave form from said third means and producing a single output pulse



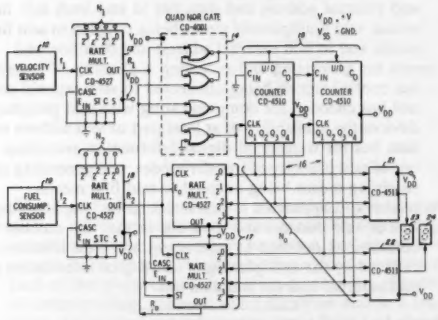
therefrom; fifth means providing a measured time interval; sixth means performing a voltage summation time derivative measurement during said time interval; seventh counter/means counting the number of pulsatile impulses occurring during said measured time interval; and eighth means multiplying the output of said seventh means by the output of said sixth means; and ninth means displaying the output of said eighth means.

4,112,492

FUEL ECONOMY MEASURING CIRCUIT EMPLOYING RATE MULTIPLIER COMPONENTS

Gary J. Summers, 1454 Nesbit Ct., San Jose, Calif. 95120

Filed Jan. 18, 1977, Ser. No. 760,426
Int. Cl.[2] G01M *15/00*
U.S. Cl. 364—442 **6 Claims**



1. In a fuel economy measuring circuit:

rate multiplier means responsive to an inputted first signal comprising a train of pulses at a first rate R_2 which is a function of the rate of consumption of fuel and to an inputted second signal N_0 which is a function of the output signal of the measuring circuit in distance per unit of fuel quantity to produce an output signal R_0 comprising a train of pulses at a rate corresponding to the product R_2N_0 of said first and second inputted signals; and

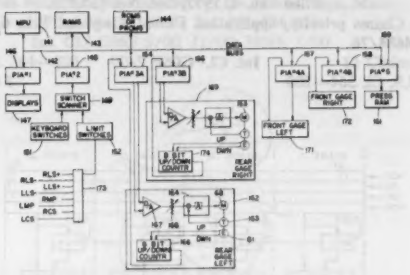
up-down counter means having input terminal means connected to receive a train of pulses having a rate R_1 which is a function of the velocity of the vehicle for counting in one direction and to receive said output train of pulses at the rate R_0 derived from the output of said rate multiplier for counting in the opposite direction, said up-down counter means being responsive to said inputted train of pulses to derive said output signal N_0 which is a measure of the fuel economy in distance per unit of fuel consumption of the vehicle.

4,112,493

TWIN MOTOR AND SCREW DRIVE FOR WORKPIECE POSITIONING STOPS AND FOR PRESS RAM DRIVE AND THE LIKE

Gerald V. Roch, and Chris L. Hadley, both of Indianapolis, Ind., assignors to Hurco Manufacturing Company Inc., Indianapolis, Ind.

Filed Nov. 7, 1975, Ser. No. 630,011
Int. Cl.[2] G06F *15/46;* B21D *5/02*
U.S. Cl. 364—476 **20 Claims**



1. In machine tool apparatus including at least two members to be driven linearly in synchronism, and at least two drive motor and screw combinations for driving said members, one motor and screw combination being for each of said members, the improvement comprising:

digital data processing control means coupled to said motors and monitoring, separately for each motor-screw combination, a mechanical movement uniformly related to the linear position of the member driven by said combination, and controlling at least one of the combinations to limit the difference between such mechanical movements, said control means being thereby able to cause said motor-screw combinations to drive said members in synchronism to a plurality of discrete predetermined linear positions in said apparatus, and stop said members in synchronism at said predetermined positions, one-at-a-time.

4,112,494

REFINERY AND PIPELINE MONITORING SYSTEM

Peter F. D. Elliott, and Kenneth Elliott, P.O. Box 31227, Cincinnati, Ohio 45231

Filed Jul. 12, 1976, Ser. No. 704,538
Int. Cl.[2] G01M *3/28;* G01F *1/00;* G06F *15/46*
U.S. Cl. 364—510 **14 Claims**

1. Apparatus for monitoring losses in a fluid flow system, such as a refinery or pipeline, comprising:

at least two measurement stations located at separate positions along a fluid flow path, each said measurement station having means for measuring data related to fluid flowing through said fluid flow path at said separate positions during a series of intervals of operation of said fluid flow system,

said data including a gross amount of fluid which has flowed past each said measurement station during each interval of said series of intervals of operation,

memory means for storing information related to accuracy

of operation of said data measuring means and information related to physical properties of said fluid,

sample number selector means for entering a preselected number, and

a loss indicator associated with said at least two measurement stations, memory means, and sample number selector means, said loss indicator including

(a) net fluid calculation means responsive to said data and information for calculating a net amount of fluid which has flowed past each of said at least two measurement stations during each interval of said series of intervals of operation,

(b) current loss calculation means for subtracting said net amount of fluid for a first of said at least two measurement stations from said net amount of fluid for a second of said at least two measurement stations to signify a current loss for each interval of said series of intervals of operation,

(c) a flag having a reset condition when said current loss relates to a first interval of operation and a set condition when said currrent loss relates to subsequent intervals of operation,

(d) first means under control of said flag when said flag is in said reset condition for entering said current loss as a reference loss,

(e) second means under control of said flag when said flag is in said reset condition for setting said flag,

(f) third means under control of said flag when said flag is in said reset condition for entering the quantity zero as a reference increment,

(g) fourth means responsive to said preselected number and under control of said flag when said flag is in said set condition for determining when said preselected number is zero and non-zero,

(h) fifth means under control of said fourth means when said preselected number is zero for entering said current loss as said reference loss,

(i) current increment calculation means under control of said fourth means when said preselected number is non-zero for dividing said current loss by said preselected number to signify a current increment,

(j) first decision means responsive to said current increment for determining when said current increment has a different polarity than said reference increment,

(k) second decision means responsive to said current increment for determining when said current increment has a greater magnitude than said reference increment,

(l) third decision means responsive to said current increment for determining when said current increment is zero,

(m) sixth means under control of said decision means for entering said current increment as said reference increment when said polarity is different, when said magnitude is greater, and when said current increment is zero,

(n) loss indication calculation means for adding said reference increment and said reference loss to signify a loss indication, and

(o) means for displaying said loss indiction,

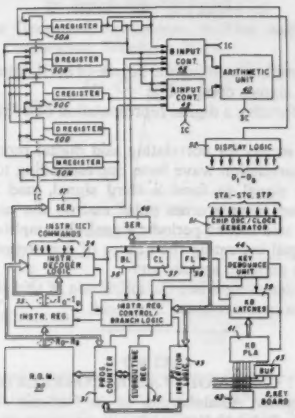
said loss indicator for distributing a surge in the operation of said fluid flow system which occurs during any of said subsequent intervals of operation over a number of intervals of operation equal to said preselected number so as to smooth each said surge over a series of loss indications.

4,112,495

ELECTRONIC CALCULATOR OR MICROPROCESSOR HAVING A SELECTIVELY LOADABLE INSTRUCTION REGISTER

Steven J. Easley, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 9, 1977, Ser. No. 767,084
Int. Cl.[2] G06F 9/06
U.S. Cl. 364—700 **16 Claims**



1. An electronic microprocessor system comprising:

(a) a data memory for storing numeric data,

(b) an arithmetic unit for performing arithmetic operations on the numeric data stored in said data memory,

(c) an instruction memory for storing a plurality of instruction words, said instruction words controlling the operation of said system, including controlling the transfer of data from said data memory to said arithmetic unit,

(d) a program counter for addressing said instruction memory,

(e) first decoder logic means responsive to at least a portion of each instruction word outputted from said instruction memory for generating an enabling signal for selected ones of said plurality of instruction words,

(f) an instruction word register means for temporarily storing the instruction word outputted from said instruction memory when enabled by said first decoder logic means,

(g) second decoder logic means for decoding said selected ones of said plurality of instruction words loaded into said instruction word register,

(h) third decoder logic means for decoding those instruction words outputted from said instruction memory means which are not loaded into said instruction word register means, and

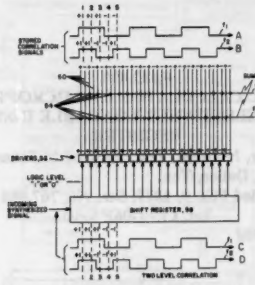
(i) means for inserting a predetermined digital code in said instruction word register means when not enabled by said enabling signal.

4,112,496

CAPACITOR MATRIX CORRELATOR FOR USE IN THE CORRELATION OF PERIODIC SIGNALS

Robert R. Stevens, Chelmsford, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 532,344, Dec. 13, 1974, Pat. No. 4,028,699.
This application Feb. 18, 1977, Ser. No. 769,994
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—728 7 Claims



1. Apparatus for detecting the degree of correlation between two periodic signals comprising:

means for forming a digital representation of a first periodic signal;

capacitive means for correlating said digital representation with a correlation wave form corresponding to a second periodic signal to form a third signal, said capacitive means including a cross point matrix, the cross points defining said second periodic signal, the amplitude of said third signal indicating the degree of correlation between said two periodic signals, and

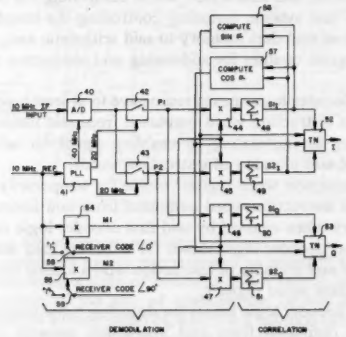
means for detecting when the amplitude of said third signal exceeds a predetermined threshold.

4,112,497

DIGITAL DEMODULATOR-CORRELATOR

James C. Fletcher, Administrator of the National Aeronautics and Space administration, with respect to an invention of; James W. Layland; Warren L. Martin, both of La Canada; Arthur I. Zygielbaum, Arcadia; Richard M. Goldstein, La Canada, and William P. Hubbard, Glendale, all of Calif.

Filed Mar. 29, 1977, Ser. No. 782,464
Int. Cl.[2] G06F *15/34;* G01S *9/38*
U.S. Cl. 364—728 12 Claims



1. Apparatus for demodulation of a code modulated signal having a predetermined frequency and for correlation of the demodulated signal with a reference code, comprising

means for sampling said code modulated signal at a frequency four times said predetermined frequency and for converting each sample to digital form, thereby to produce four equally spaced successive samples A1, B1, A2 and B2 in digital form for each cycle of said modulated signal,

four separate means for accumulating multiplication products of M1 and M2 with said samples in digital form thereby to produce four sums according to the following equations:

$$S1_I = \sum_I (A1 - A2)\,M1 \qquad S1_Q = \sum_I (A1 - A2)\,M2$$

$$S2_I = \sum_I (B1 - B2)\,M1 \qquad S2_Q = \sum_I (B1 - B2)\,M2$$

where M1 is a reference signal at said predetermined frequency multiplied by said reference code, and M2 is said reference signal multiplied by said reference code delayed one quarter of a cycle,

means for computing inphase and quadrature correlation functions I and Q, respectively, from said sums in accordance with the following equations:

$$I = S1_I \cos\alpha - S2_I \sin\alpha$$

$$Q = S1_Q \cos\alpha - S2_Q \sin\alpha$$

where sin α and cos α are determined at the start of demodulation operations according to the following equations:

$$\sin\alpha = \frac{S1_I}{\sqrt{S1_I^2 + S2_I^2}}, \cos\alpha = \frac{S2_I}{\sqrt{S1_I^2 + S2_I^2}}$$

while both multipliers M1 and M2 are made to be equal to said reference signal, and

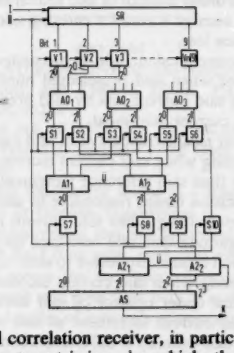
means for making both multipliers M1 and M2 equal to said reference by setting said reference code and said reference code delayed one quarter of a cycle equal to 1 at the start of demodulation and correlation operations while sin α and cos α are being determined.

4,112,498

DIGITAL CORRELATION RECEIVER

Udo Reiner, Munich, and Gerhard Hinrichsen, Geretsried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 3, 1977, Ser. No. 765,401
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1976, 2607433
Int. Cl.[2] G06F *15/34;* H04B *7/19*
U.S. Cl. 364—728 4 Claims



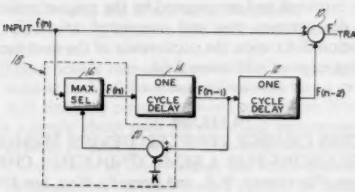
1. In a digital correlation receiver, in particular for satellite communications transmission, in which the signal bursts, which are combined in a time division multiplex arrangement and provided with a preamble comprising a synchronizing word, from various ground stations, are time-staggered at the

satellite end and, relative to the reference burst which marks the beginning of the frame, are combined to form a frame and retransmitted with time division multiple access, the combination of a shift register to which the incoming bit flow at the receiving end is supplied, comparator means to which the individual cells of the shift register are connected, and at whose second comparator inputs a logic state exists representing the synchronizing word, with which the received word in the respective shift register cells, following complete input thereof into the register, should coincide, a first group of adder stages to which is connected the respective outputs of the comparator means, a plurality of storage elements, each adder stage having a pair of outputs, respectively having the values 2^0 and 2^1, each of which outputs is connected to a respective storage element, at least one second group of adder stages, to which outputs of said storage elements are connected in predetermined grouping, further storage elements to which the intermediate addition results of said second group of adder stages are respectively supplied, an analysis device, means for producing a data word, said means connected between said second group of adder stages and said analysis device to provide said data word as an input to said analysis device, said analysis device in the presence of a correct data word supplying a correlation signal, and timing means for controlling such shift register and the respective storage elements.

4,112,499
DIGITAL TRANSIENT DISCRIMINATOR WITH NOISE SPIKE CLIPPING

Norman W. Mangum, Jr., and Howard W. Ripy, both of Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 17, 1977, Ser. No. 778,640
Int. Cl.[2] G06F *13/00, 15/20*
U.S. Cl. 364—732 **4 Claims**



1. For a sensor that produces an input signal to logic means for determining the unidirectional transient in said input, said logic including means responsive to an output signal for generating a first delayed cycle signal and a second delayed cycle signal, first summer means for combining the first delayed cycle signal with a constant, second summer means for combining the second delayed cycle signal with said input signal and a maximum selector means responsive to said input signal and the output of said first summer means for selecting the higher value of either said input signal or the output of said first summer means to generate an input signal to said generating means.

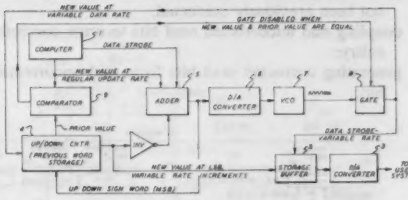
4,112,500
SMOOTHING OF UPDATED DIGITAL DATA

David L. Peters, Whitney Point, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Jan. 19, 1976, Ser. No. 650,102
Int. Cl.[2] G06F *3/00, 5/06*
U.S. Cl. 364—900 **8 Claims**

1. In a digital computer system in which data is updated periodically, a method for interfacing a computer and a user system which is responsive to said computer, whereby updated data is transmitted to the user system, at variable data rates, relatively higher than the nominal data update rate of the computer, and in least significant bit increments comprising the steps of:

(a) determining, at the nominal computer update rate, a delta word that is the difference between the value of the data prior to update and its value when updated;



(b) converting said delta word into a signal whose output frequency is proportional to the magnitude of said delta word;

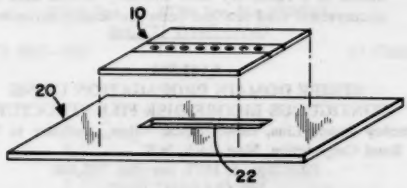
(c) using said signal to update said prior data to new values in least significant bit increments; and

(d) strobing said new values out to the user system.

4,112,501
SYSTEM AND METHOD FOR LOADING COMPUTER DIAGNOSTIC PROGRAMS

Alf Gunnar Önnestam, Kungsängen, Sweden, assignor to Data General Corporation, Westboro, Mass.

Filed Jun. 9, 1976, Ser. No. 694,442
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—900 **5 Claims**



1. Diagnostic computer program transfer system comprising a magnetic tape having a diagnostic computer program of **1** and **0** bits magnetically stored thereon at audio frequencies, a magnetic tape converter means for playing said magnetic tape and providing an electrical sinusoidal wave train of two different audio frequencies representing the **1** or **0** bits of the diagnostic computer program stored by said magnetic tape, wave shaping means for converting the sinusoidial wave train into a series of pulses of different widths depending upon the instantaneous frequency of the sinusoidal wave train, wave train generating means for generating a wave train of pulses from said series of pulses of different widths, the spacing between successive pulses representing either a **1** or **0** bit, a computer having storage means for receiving said wave train of pulses to thereby store said diagnostic computer program, and control means providing signals to control the generation of said wave train of pulses by said wave train generating means.

4,112,502
CONDITIONAL BYPASS OF ERROR CORRECTION FOR DUAL MEMORY ACCESS TIME SELECTION

James Herman Scheuneman, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 733,687, Oct. 18, 1976, Pat. No. 4,058,851.
This application Jul. 18, 1977, Ser. No. 817,081
The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.
Int. Cl.[2] G06F *11/10, 13/00, 11/00, 1/04*
U.S. Cl. 364—900 **3 Claims**

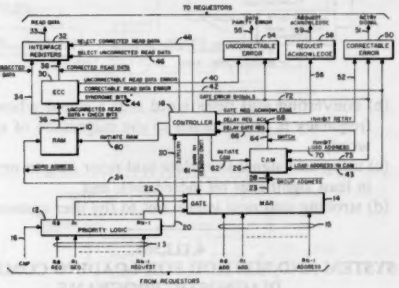
1. A method of conditionally bypassing the error correction circuitry of an error correcting memory system, comprising:

reading out the uncorrected read bits that are stored in a memory;

determining if said read out uncorrected read bits had or had not been previously corrected;

coupling said uncorrected read bits to error correction circuitry;

generating corrected read bits from said uncorrected read bits;



coupling said uncorrected read bits to gating means;

coupling said corrected read bits to said gating means;

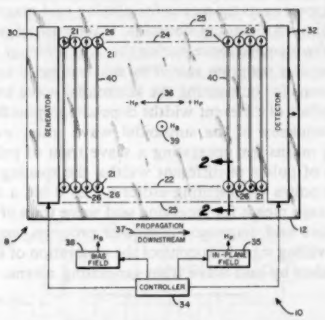
gating said uncorrected read bits from said gating means at a relatively fast memory access time if said uncorrected read bits had not been previously corrected or, alternatively, gating said corrected read bits from said gating means at a relatively slow memory access time if said uncorrected read bits had been previously corrected.

4,112,503

STRIPE DOMAIN PROPAGATION USING CONTIGUOUS BICORE DISK FILE STRUCTURE

Stanley James Lins, Bloomington, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,808
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—29 **7 Claims**



1. A stripe domain propagation system, comprising:

a non-magnetic substrate;

a stripe domain layer of a material capable of sustaining stripe domains and having a stripe domain propagation axis in the plane thereof;

two substantially similar contiguous disk files parallelly aligned along said propagation axis and separated for forming a stripe domain area therebetween through which stripe domains are to be propagated in said magnetizable layer in a downstream propagation direction along said propagation axis, each of said contiguous disk files comprised of;

a plurality of Bicore disks aligned in contiguous series along said propagation axis, each of said Bicore disks comprising,

a relatively hard magnetizable disk having an axis of anisotropy oriented transverse to said propagation axis;

a relatively soft magnetizable disk for providing a closed flux path for the otherwise open flux path of the external field of said relatively hard magnetizable disk, the external field of said relatively hard magnetizable disk orienting the magnetization of said relatively soft magnetization disk antiparallel therewith except when effected by an appropriate drive field; and,

an insulative layer sandwiched between said relatively soft and hard magnetizable layer for providing magnetostatic coupling therebetween;

a stripe domain in said stripe domain layer having each of its two ends associated with an associated one of said relatively soft magnetizable disks in the associated one of said two contiguous disk files;

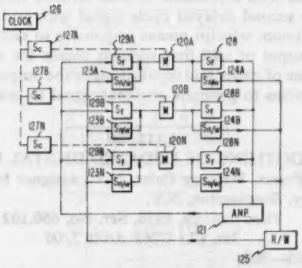
drive field means coupling a bipolar drive field directed along said propagation axis, said drive field having a relatively slowly increasing leading edge and a relatively quickly decreasing trailing edge, said trailing edge rotating the magnetization of said two end associated relatively soft magnetizable disks out of alignment with the axis of anisotropy of said relatively hard magnetizable disks toward a direction opposite to said propagation direction for capturing the ends of said stripe domain at an upstream position, said leading edge then rotating the magnetization of said two end associated relatively soft magnetizable disks toward said propagation direction and propagating said captured stripe domain in said propagation direction from said upstream position to a downstream position, and then said trailing edge rotating the magnetization of said two end associated relatively soft magnetizable disks quickly back toward said direction opposite to said propagation direction for leaving said captured stripe domain behind in said propagated downstream position to be captured and propagated by the magnetization of the next downstream two end associated relatively soft magnetization disks upon the occurrence of the next successive leading edge of said drive field.

4,112,504

FAST ACCESS CHARGE COUPLED DEVICE MEMORY ORGANIZATIONS FOR A SEMICONDUCTOR CHIP

Satish L. Rege, Piscataway, N.J., and Beng-Yu Woo, San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 20, 1976, Ser. No. 734,351
Int. Cl.[2] G11C *21/00*
U.S. Cl. 365—77 **5 Claims**



1. A charge coupled device memory organization including a plurality of storage loops, said organization comprising:

a read/write station;

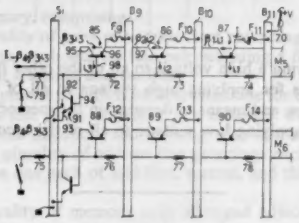
a plurality of pairs of read and write switches, one pair for each storage loop to selectively couple that respective storage loop to said read/write station for reading and writing operations; and

a refresh amplifier coupled to said storage loops separate from the coupling of said read/write station.

4,112,505
READ-ONLY-MEMORY WITH SHUNT PATH TO DIVERT PROGRAMMING CURRENT

Jean-Claude Duval, Le Perreux; Francis Joseph Mottini, Eaubonne; Serge Auguste Touron, Bagnolet; Jean-Jacques Francois Rennard, Sartrouville, and Ruchela Marie Duval, Le Perreux, all of France, assignors to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull, Paris, France

Filed Dec. 1, 1976, Ser. No. 746,435
Claims priority, application France, Dec. 5, 1975, 75 37358
Int. Cl.[2] G11C *17/00*
U.S. Cl. 365—96 **11 Claims**



1. An integrated circuit read-only memory formed on a semiconductor substrate programmable by selectively applying programming currents to destructable memory elements comprising:

(a) word rows of mutually parallel, linear resistive semiconductor bands in the substrate,

(b) bit columns of N mutually parallel conductive wires which cross the bands at intersections;

(c) an insulating layer on said substrate separating said bands and wires;

(d) destructible memory elements for connecting a band to a wire at each of the intersections whereby a group of N of said elements connect a word row to the N wires; and

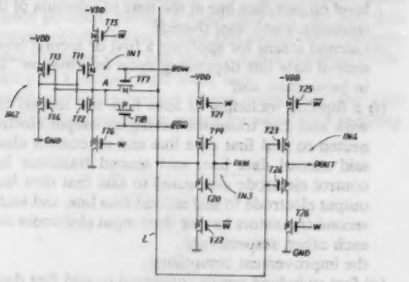
(e) a single shunt path for diverting programming current applied to each group of N memory elements connecting a word row to the N wires, the shunt path diverting the programming currents from a portion of the semiconductor band in each row.

4,112,506
RANDOM ACCESS MEMORY USING COMPLEMENTARY FIELD EFFECT DEVICES

Mituo Zibu, Ueno, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 27, 1977, Ser. No. 837,287
Claims priority, application Japan, Oct. 7, 1976, 51-121141
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—181 **4 Claims**

1. A random access memory using complementary field effect devices, comprising an array of a plurality of storing locations, address signal lines for addressing said plurality of storing locations, a data signal line commonly coupled to said plurality of storing locations for inputting/outputting a data signal, each said location comprising a storing cell including first and second inverter means cross connected to each other and each implemented by complementary field effect devices and having an input/output node, field effect switching means connected in series with said first inverter means and adapted to be non-conductive in a write operation mode, transmission gate means connected between said input/output node of said storing means and said data signal line to be operable as a function of the signal in said address signal line, said transmission gate means comprising two complementary field effect switching devices connected in parallel with each other, each individually responsive to the complementary state of the signal in said address signal line, said random access memory further comprising third inverter means implemented by com-

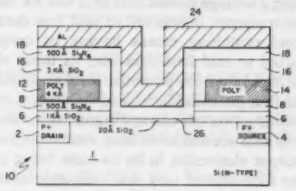


plementary field effect devices and having the output connected to said data signal line, and field effect switching means connected in series with said third inverter means and adapted to be conductive in the write operation mode.

4,112,507
ADDRESSABLE MNOS CELL FOR NON-VOLATILE MEMORIES

Marvin Hart White, Laurel, and Donald Ross Lampe, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1976, Ser. No. 653,849
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—184 **17 Claims**



1. A MNOS transistor comprising:

a substrate of a given conductivity type;

a plurality of separated diffusion regions in said substrate of opposite conductivity type, defining drain and source diffusions;

a first address gate defining a memory window between said diffusion regions;

a second address gate overlapping said source diffusion and extending toward said memory window; and

dual dielectric insulation means of different thicknesses associated with said gates for storing charges in a non-volatile manner.

4,112,508
SEMICONDUCTOR MEMORY

Kiyoo Itoh, Higashikurume, Japan, assignor to Hitachi, Ltd., Japan

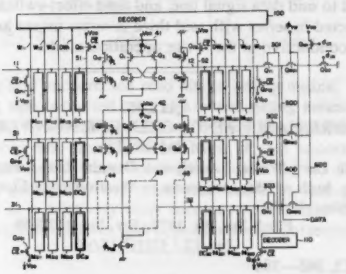
Filed Sep. 7, 1977, Ser. No. 831,138
Claims priority, application Japan, Sep. 10, 1976, 51-107792
Int. Cl.[2] G11C *11/40, 13/00*
U.S. Cl. 365—154 **25 Claims**

1. In a memory comprising:

(a) first and second data lines;

(b) a plurality of word lines arranged so as to cross said first and second data lines;

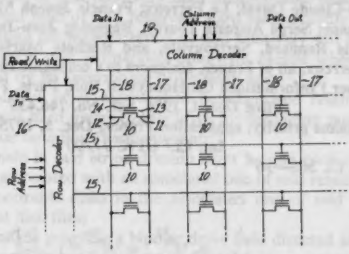
(c) first means for selectively applying a predetermined signal to one of said word lines;
(d) memory cells provided at the intersections of said data lines and said word lines for storing therein a potential level on said data line at the time of selection of the corresponding word lines thereof;
(e) second means for applying a first or second level to said second data line depending upon information "1" or "0" to be written; and
(f) a flip-flop including at least first and second transistors with said first transistor having its output electrode connected to said first data line and its control electrode to said second data line, said second transistor having its control electrode connected to said first data line and its output electrode to said second data line, and said first and second transistors having their input electrodes coupled to each other, respectively.
the improvement comprising:
(g) first switching means connected to said first data line for



applying a voltage to said first data line for turning off said second transistor connected to said first data line;
(h) second switching means having its output electrode connected to said first data line, its input electrode to a power supply whose potential level is substantially equal to said first potential level and its control electrode supplied with an on-off control signal, the value of conductance of said second switching means between said input and output electrodes in its on-state being selected to be smaller than that of said first transistor in its conductive state;
(j) means for controlling said first switching means so as to be operative during a predetermined time prior to the storing of information into said memory cells; and
(k) means for applying a control signal making said second switching means low resisitive to said control electrode of said second switching means after the lapse of said predetermined time and in a state in which said predetermined potential is applied to said second data line with the aid of said second means.

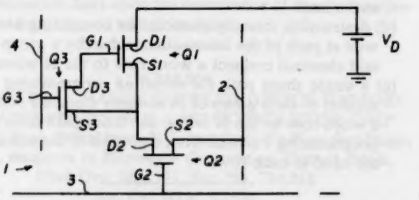
4,112,509
ELECTRICALLY ALTERABLE FLOATING GATE SEMICONDUCTOR MEMORY DEVICE
Lawrence S. Wall, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 27, 1976, Ser. No. 754,144
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—185 **10 Claims**

1. An electrically programmable, non-volatile, floating gate, semiconductor memory array comprising: a plurality of MOS transistor devices each having a source, a drain, a floating gate, and a control gate, the transistor devices being arranged in an array of rows and columns; means for connecting the control gates of all devices in each row together to provide row lines; means connecting the sources of all devices in each column together to provide first column lines generally perpendicular to the row lines; means connecting the drains of all devices in each column together to provide second column lines generally parallel to the first column lines; means for selecting one of the row lines and applying a high voltage to it while applying a low voltage to the remaining row lines; means for selecting one of the first column lines and applying a low voltage to it



while applying a high voltage to all of the other first column lines; means for applying high voltage to all of the second column lines; and means to deprogram the memory including means for applying low voltage to all of the second column lines.

4,112,510
DYNAMIC MEMORY CELL WITH AUTOMATIC REFRESHING
Roger Thomas Baker, Box 240, Mt. Tabor, N.J. 07878
Filed May 25, 1977, Ser. No. 800,450
Int. Cl.[2] G11C *11/40, 7/00*
U.S. Cl. 365—187 **19 Claims**

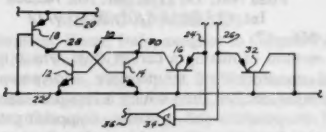


1. A semiconductor memory cell comprised of
a first IGFET and a second IGFET, both of said IGFETs having a source, a drain, and a gate,
the said source of said first IGFET and the said source of said second IGFET being connected in common,
the said gate of said first IGFET and the said drain of said second IGFET being connected in common,
said second IGFET having a first channel region and a second channel region, both said first and said second channel regions being located generally beneath the said gate of said second IGFET,
said source of said second IGFET, said first channel region, said second channel region, and said drain of said second IGFET being disposed such that they are electrically in series, in the order specified above, and
the electronic properties of said first channel region being related to the electrical potential of said gate of said second IGFET by one set of parameters,
the electronic properties of said second channel region being related to the electrical potential of said gate of said second IGFET by a second set of parameters, and
said first set of parameters being different from said second set of parameters.

4,112,511
FOUR TRANSISTOR STATIC BIPOLAR MEMORY CELL USING MERGED TRANSISTORS

Raymond A. Heald, Los Gatos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Sep. 13, 1977, Ser. No. 832,940
Int. Cl.² G11C *11/40, 13/00*
U.S. Cl. 365—188 18 Claims



5. A memory, comprising:

(a) a plurality of pairs of address lines extending in a given direction, each address line pair including a first address line and a second address line,

(b) a like plurality of third address lines, one for each of said address line pairs, extending in a direction transverse to said given direction, and forming with said address line pairs a plurality of address line groupings each of which includes one each of said first, second, and third address lines,

(c) a plurality of memory cells arranged adjacent to and interconnected with said address line groupings, there being a memory cell for each one of said address line groupings and each memory cell connected with a respectively different address line grouping, each of said memory cells comprising:

(1) first and second switching transistors each having base, emitter, and collector terminals, with their base terminals cross coupled to their collector terminals to form first and second node points and their emitter terminals connected to one of said second address lines,

(2) A first source transistor having base, emitter and collector terminals, with its base terminal connected to said one second address line, its emitter terminal connected to one of said third address lines and its collector terminal connected to said second node point, and

(3) a second source transistor having base, emitter, and collector terminals, with its base terminal connected to said one second address line, its emitter terminal connected to one of said first address lines, and its collector terminal connected to said first node point.

4,112,512
SEMICONDUCTOR MEMORY READ/WRITE ACCESS CIRCUIT AND METHOD

Luis Maria Arzubi, Colchester, Vt.; Joerg Gschwendtner, Esslingen, and Robert Schnadt, Boeblingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

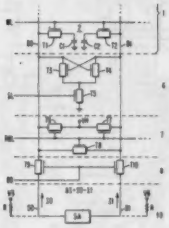
Filed Dec. 22, 1977, Ser. No. 863,566
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712735
Int. Cl.² G11C *11/40*
U.S. Cl. 365—203 8 Claims

1. A read/write circuit for a dynamic field effect transistor memory system including a matrix of dynamic storage cells, each storage cell having a capacitive storage node capable of being coupled to a column line in response to an addressable row selection means, a plurality of pre-amplifiers connected to said column lines for detecting and amplifying signals coupled to said column lines by said row selection means and at least one input/output terminal capable of being coupled to at least some of said column lines by the current conducting terminals of a field effect transistor switching means, the improvement comprising:

column line precharging means for precharging said column lines to a predetermined first reference potential corresponding to a first stored logic state;

input/output terminal precharging means for precharging said input/output terminal to a second predetermined reference potential having a magnitude less than said first reference potential by more than one field-effect transistor threshold voltage drop and greater than a potential corresponding to a second logic state; and

addressable column selection means coupled to the gate electrode of said switching means for selectively applying

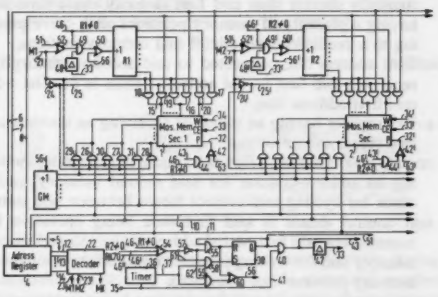


a third reference potential to at least one of said switching means, said third reference potential having a magnitude not greater than one field effect threshold voltage drop above said second reference potential, whereby said field-effect transistor switching means will become conductive when the potential of a data signal to be coupled between a selected on of said column lines and said input/output terminal has a magnitude of less than one field-effect transistor threshold drop below said third reference potential.

4,112,513
METHOD FOR REFRESHING STORAGE CONTENTS OF MOS MEMORIES

Peter Elsner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 27, 1973, Ser. No. 401,190
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1972, 2247835
Int. Cl.² G11C *29/00*
U.S. Cl. 365—222 12 Claims



1. A method for refreshing the contents of a dynamic MOS memory, having a plurality of independently addressable sections, including the steps of simultaneously refreshing all but one section of said memory concurrently with each normal access for reading or writing to said one section, said refreshment occurring during each normal access to said one section, said one section comprising any one of said plurality of sections.

4,112,514

MEMORY WITH DYNAMIC INFORMATION STORAGE

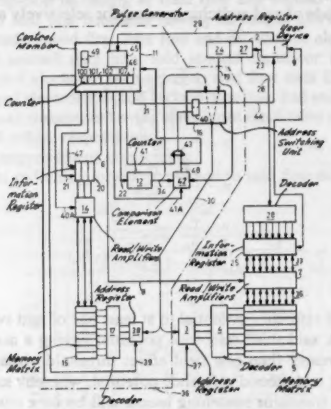
Gerrit Adriaan Spoelder, Apeldoorn, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,746

Claims priority, application Netherlands, Jan. 22, 1976, 7600648

Int. Cl.² G11C 11/40

U.S. Cl. 365—222 2 Claims



1. A memory system for operation with a user device, comprising:

a first memory comprising memory sections for information storage, and having a first memory cycle time;

a first address line connected to said first memory for receiving first partial address signals from said user device for addressing a memory section thereof, and controlling a refresh operation therein;

a second address line connected to said first memory for receiving second partial address signals from said user device for addressing a portion of said memory section addressed by said first partial address signals,

an information transport line connected to said first memory for transporting information signals between said user device and said memory section portion addressed by said first and second partial address signals;

a second memory having a second memory cycle time substantially shorter than said first memory cycle time and having a plurality of memory positions each corresponding to a predetermined one of said memory sections;

a third address line connected to said second memory for receiving said first partial address signals in parallel with said first address line,

a data register having an input for receiving an incrementation signal and an output;

control means habing a first state and a second state, including an address-counter for said second memory, and a clock for cycling said control means between said states,

said control means in said first state being operative for transmitting said first partial address signals to said second memory and for writing predetermined information into a memory position thus addressed,

said control means in said second state being operative for transmitting the contents of said address counter after an incrementation thereof to said second memory for controlling a read-write cycle for the memory position thus addressed under further generation of an incrementation signal for writing back an incremented information,

an output signal of said data register blocking the next subsequent transition to said first state, whereby said first memory thereupon is addressed by the contents of said address counter in lieu of by said first partial address signals, a memory section thus addressed being refreshed at least once within its reliability period.

4,112,515

MIXING CATALYST AND CARRIER GAS FOR CURING FOUNDRY MOLDS AND CORES

Louis W. Sandow, N94 W15888 Ridgeview Dr., Menomonee Falls, Wis. 53051

Filed Nov. 19, 1976, Ser. No. 743,368

Int. Cl.² B01J 8/02; B22C 9/12

U.S. Cl. 366—17 6 Claims

1. A method of mixing a carrier fluid which is gaseous at standard conditions of temperature and pressure with a foundry mold catalyst fluid which is liquid at standard conditions of temperature and pressure, comprising the steps of heating said liquid foundry mold catalyst fluid to vaporize it before it is mixed with the carrier fluid, flowing said carrier fluid in the gaseous state through a first conduit into a second conduit, flowing said foundry mold catalyst fluid in the gaseous state through a third conduit into said second conduit to form a gaseous mixture therein, controlling the flow rate in at least one of said first and third conduits in accordance with the equation $X_2 = KX_1$ where X_1 is the flow rate of said carrier fluid in the gaseous state, X_2 is the flow rate of said foundry mold catalyst fluid in the gaseous state, K is a predetermined mass ratio between said foundry mold catalyst fluid and said carrier fluid in said gaseous mixture.

4,112,516

PLASTICIZING DEVICE OF AN INJECTION MOLDING MACHINE FOR PLASTICS

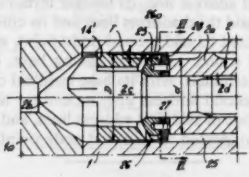
Alfons Hotz, Nafels, Switzerland, assignor to Netstal-Maschinen AG, Switzerland

Filed Sep. 15, 1976, Ser. No. 723,228

Claims priority, application Switzerland, Sep. 17, 1975, 12072/75

Int. Cl.² B29B 1/10, 5/04

U.S. Cl. 366—80 3 Claims



1. A plasticizing device for an injection molding machine for plastic material comprising a screw housing having a cylindrical plasticizing material chamber and an end of said chamber having a discharge opening, a cylindrical screw rotatably and axially displaceably mounted in said housing and having a screw head portion adjacent the discharge opening, a uniform diameter portion with a radially extending spiral screw and an intermediate body portion located between said head portion and said uniform diameter portion, a seal ring of an outer diameter substantially the same as the interior diameter of said chamber disposed in said chamber and having an inner diameter greater than and spaced radially outwardly from said intermediate portion of said screw to define a plasticizing material passage therebetween, a seal washer on said screw in the vicinity of the junction between said intermediate body portion and said uniform diameter portion having a sealing face cooperatively opposed to a sealing face of said seal ring, means defining a plurality of axially extending and circumferentially spaced passages around the periphery of said screw adjacent said seal washer in at least two spaced apart rows which are disposed in axial relationship, and a separate insert ring mounted on said screw between said seal washer and said

screw, wherein said rows are offset from each other and the passages extend radially inwardly substantially to the diameter of said uniform diameter portion, one of said rows being disposed around said seal washer, the other of said rows being disposed around said insert ring and defining a space between said two rows, wherein said passages intersect at acute angles to each other.

4,112,517

MIXING APPARATUS

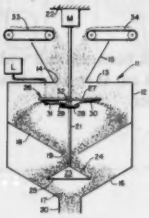
Giuseppe Giombini, Rome, Italy, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 593,997, Jul. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 465,760, May 1, 1974, Pat. No. 3,986,706. This application Apr. 20, 1977, Ser. No. 789,102

Claims priority, application Italy, May 23, 1973, 60165 A/73

Int. Cl.² B01F *5/26, 13/02*

U.S. Cl. 366—102 **19 Claims**



1. Apparatus for homogeneously mixing relatively dry particulate material with liquid material comprising a distributor member rotatable about a vertical axis, means for feeding dry particulate material directly onto said distributor member for centrifugal distribution therefrom whereby there is formed below said distributor member a continuous annular free falling curtain layer of said particulate material, means below said distributor member within said curtain layer for forming and directing a separate continuous annular film or spray of liquid material into direct intersecting relation with said falling curtain layer in an annular region spaced outwardly beyond and below the periphery of said distributor member, further distributor means rotatable about said axis and located below said liquid film forming means to receive and centrifugally distribute the mixed particulate and liquid materials, means above said further distributor means for collecting said falling curtain and the admixed liquid materials and directing the same to said further distributor means, and means for collecting and discharging the centrifugally distributed material from said further distributor means.

4,112,518

MIXER FOR LIQUID CHARGES

Leslie H. Garlinghouse, 2415 E. Washington, Los Angeles, Calif. 90021

Continuation of Ser. No. 364,881, May 29, 1973, Pat. No. 3,962,892, and a continuation-in-part of Ser. No. 575,437, May 7, 1975, Pat. No. 4,072,030, and Ser. No. 774,193, Mar. 3, 1977. This application Jun. 29, 1977, Ser. No. 811,163

Int. Cl.² B01F *7/16*

U.S. Cl. 366—219 **5 Claims**

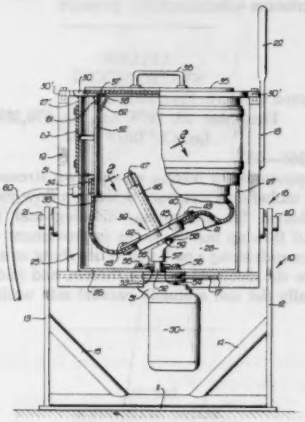
1. A mixer for a charge of predetermined volume of a liquid-like consistency, said mixer comprising a frame, a composite container means on the frame for said charge comprising a lower flexible section with a lower chamber of variable volume and having an upper perimetrical edge, an upper rigid section with an upper chamber of fixed volume having a rigid cylindrical wall with a lower perimetrical edge, and an attachment joining said lower and upper sections together at said edges,

a wobble plate mounted on the bottom of the flexible section,

a wobble drive rotatably journaled in a lower portion of said frame and having a driving relationship with said wobble plate,

a motor on said frame at a location below and exterior relative to said container means,

said motor having a single direction driving connection with the wobble drive whereby to impart an oscillatory motion to the flexible section and the charge, a connection between the upper rigid section and the frame, the connection being at a location spaced from the lower perimetrical edge, the volume of the lower chamber being less than the volume of the charge, and the aggregate volumes of the chambers respectively in the lower and upper sections being such as to provide a liquid level intermediate upper and lower ends of the upper rigid section, the charge being adapted to shift cyclically between said chambers during an operation in response to action of said wobble plate.



4,112,519

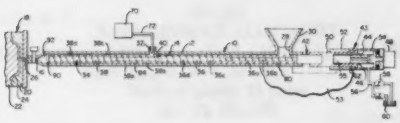
VENTED INJECTION MOLDING MACHINE AND METHOD

George A. Kruder, Marion, Ohio, assignor to HPM Corporation, Mount Gilead, Ohio

Filed Jul. 8, 1976, Ser. No. 703,440

Int. Cl.² B29B *1/08, 5/04*

U.S. Cl. 366—266 **9 Claims**



1. In a vented injection molding machine operable during a plasticizing portion of a molding cycle to accept synthetic resinous material in particulate form and to plasticize the material to a moldable consistency and operable during an injection portion of the molding cycle to shape the plasticized material into a useful form, the machine having a barrel with a feed opening, a vent opening communicating with atmospheric pressure and a discharge opening, and a rotatable reciprocable screw with a vent section in the barrel, an improvement for avoiding degradation of the plasticized material in the barrel comprising:

exclusion means operatively positioned with respect to the

barrel and the vent opening for inhibiting ingestion of deleterious atmospheric constituents so as to avoid contact of deleterious atmospheric constituents and plasticized material while permitting atmospheric pressure to prevail in the vent section; and,

wherein the exclusion means includes flood means for bathing the vent opening with an inert gas from a first time preceding inception of the injection portion until a second time after inception of the injection portion of the molding cycle where the first time and the second time are selected to bracket the time period during which the machine experiences subatmospheric pressure.

4,112,520

STATIC MIXER

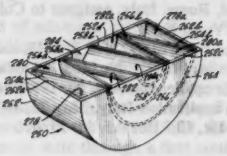
Oscar Patton Gilmore, Riverside, Calif.

Filed Mar. 25, 1976, Ser. No. 670,388

Int. Cl.[2] B01F *5/24*

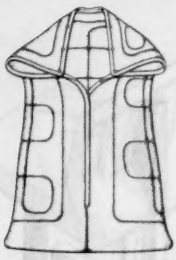
U.S. Cl. 366—337 **3 Claims**

1. In apparatus for mixing at least two streams of flowing materials including a structure defining a flow passage having means therein for combining, dividing and re-combining streams of flowing materials, the improvement wherein said passage extends along a path that bends about an axis angulated relative to the direction of flow therein, and said passage has substantially flat and mutually parallel side walls, said means including a flow dividing web in said path, said web being bent to substantially follow the bend in said path and being twisted relative to said path along the length thereof, said flow divider



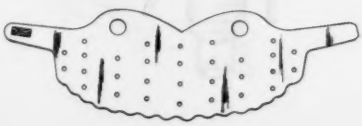
web being positioned between said walls, and said web being defined by a segment cut at an angle from a longitudinally split right circular cylinder.

249,196
INSULATED BODY GARMENT
John C. Wrightson, Darien, Conn., assignor to Heritage Quilts, Inc., New York, N.Y.
Filed Jul. 25, 1977, Ser. No. 818,969
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25



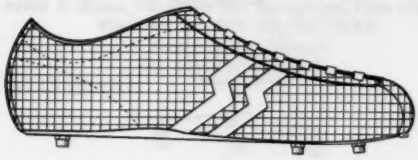
249,197
VEST
Bela Bill Szoke, 251 - E. 7th St., Long Beach, Calif. 90813
Filed May 10, 1976, Ser. No. 684,757
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—190

249,198
HAIRDRESS PROTECTOR
Stanley W. Schulman, 2 Maplewood La., Roslyn, L.I., N.Y. 11576
Filed Nov. 4, 1976, Ser. No. 739,029
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—241

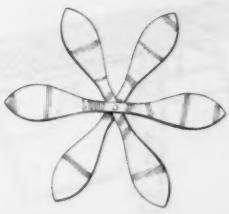


249,199
BOOT
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Aug. 23, 1976, Ser. No. 716,410
Term of patent 3 years
Int. Cl. D2—*04*
U.S. Cl. D2—274

249,200
ATHLETIC SHOE
Keiji Iimuro, No. 4-14, 3-chome, Nihonbashi, Chuo-ku, Tokyo, Japan
Filed Jan. 22, 1976, Ser. No. 651,357
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—311



249,201
NEEDLEWORK ACCESSORY
Elizabeth Nagy, 3215 E Ave. T-10, Littlerock, Calif. 93543
Filed Aug. 4, 1976, Ser. No. 711,627
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D3—19 R

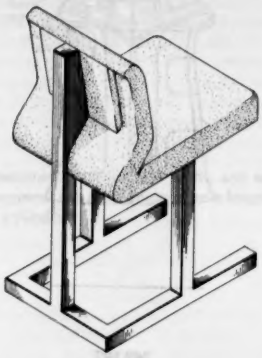


249,202
JEWELRY DISPLAY STAND
Rose L. Struble, 3298 Montieth Ave., Cincinnati, Ohio 45208, and Adele S. Katz, 8770 Arborcrest Dr., Cincinnati, Ohio 45236
Filed Sep. 2, 1976, Ser. No. 719,778
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—29

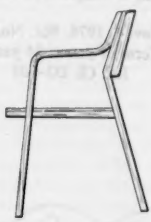
249,203
SWIVEL CHAIR
Hilton A. Gill, Sheboygan, Wis., assignor to R-Way Furniture Company, Sheboygan, Wis.
Filed Feb. 14, 1977, Ser. No. 768,044
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

249,204
BLOOD DONOR LOUNGE
Robert T. Schwartz, Takoma Park, Md., and Marc S. Harrison, Foster, R.I., assignors to American National Red Cross
Filed Nov. 9, 1976, Ser. No. 739,841
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38

249,205
CHAIR
Ernest Newell Spencer, 8625 Lakeview Dr., Orchard Beach, Lexington, Mich. 48450
Filed Feb. 28, 1977, Ser. No. 772,776
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—55



249,206
ARM CHAIR
Hilton A. Gill, Sheboygan, Wis., assignor to R-Way Furniture Company, Sheboygan, Wis.
Filed Feb. 14, 1977, Ser. No. 768,036
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

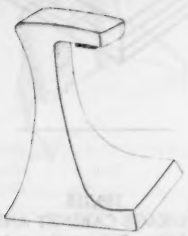


249,207

PEDESTAL FOR MAGNETICALLY SUSPENDING A BAR OF SOAP

David Emmer, 255 S. Rengstorff, Apt. #20, Mountain View, Calif. 94040

Filed May 9, 1977, Ser. No. 794,757
Term of patent 14 years
Int. Cl.[2] D23—*02;* D6—*04*
U.S. Cl. D6—89



249,208

DISPENSER FOR GRANULATED OR POWDERED PRODUCTS OR THE LIKE

Denis Victor Dibling, Avenue Brugmann 197, 1180 Brussels, Belgium

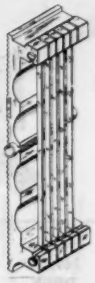
Filed Nov. 28, 1975, Ser. No. 635,921
Claims priority, application Benelux, May 28, 1975, PV157-00
Term of patent 14 years
Int. Cl.[2] D23—*02*
U.S. Cl. D6—95

249,209

AXIALLY PIVOTING SUPPORT FOR TELEPHONE DIRECTORIES OR THE LIKE

Gerard Drag, Morton Grove, Ill., assignor to General Binding Corporation

Filed Aug. 9, 1976, Ser. No. 712,734
Term of patent 14 years
Int. Cl.[2] D6—*04;* D19—*04*
U.S. Cl. D6—113

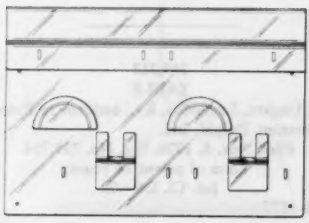


249,210

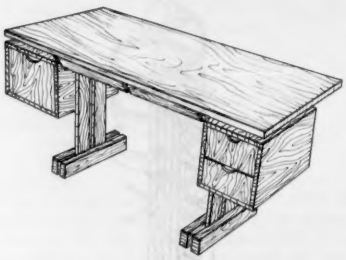
RACK FOR FIBEROPTIC SCOPES OR THE LIKE

Armin V. Banez, 510 Gypsy La., Youngstown, Ohio 44505

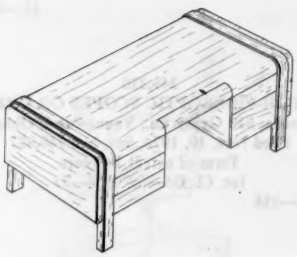
Filed Nov. 10, 1976, Ser. No. 740,857
Term of patent 14 years
Int. Cl. D6—*04;* D24—*31*
U.S. Cl. D6—114



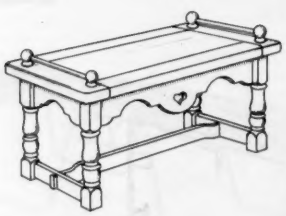
249,211
MODULAR DESK
Peter H. Wright, 47 Alvarado St., Berkeley, Calif. 94705, and Ralph G. Panecaldo, 2682 Hillgard St., Berkeley, Calif. 94709
Filed Sep. 17, 1976, Ser. No. 724,372
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



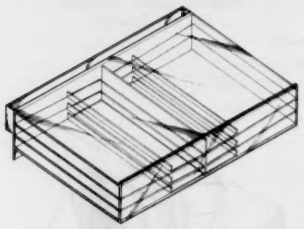
249,212
DESK
Hilton A. Gill, 2809 S. 11th St., Sheboygan, Wis. 53081
Filed Dec. 30, 1976, Ser. No. 755,786
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



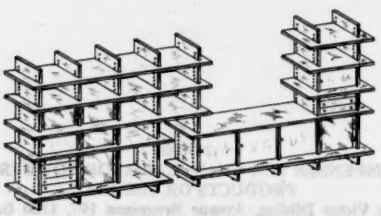
249,213
TABLE
Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Delphi, Ind.
Filed Nov. 8, 1976, Ser. No. 739,754
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



249,214
PORTABLE EDITING DESK
Irving N. Rothman, 8811 S. Rice Ave., Houston, Tex. 77096
Filed Jun. 9, 1976, Ser. No. 694,371
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—189

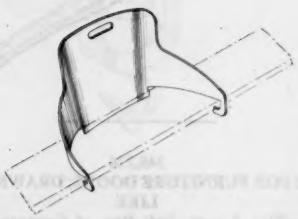


249,215
COMBINED STORAGE CABINET AND SHELF UNIT
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Italy
Division of Ser. No. 595,406, Jul. 14, 1975. This application Oct. 26, 1976, Ser. No. 735,532
Claims priority, application Italy, Jan. 15, 1975, 60904 B/75; Jan. 15, 1975, 60905 B/75
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—190

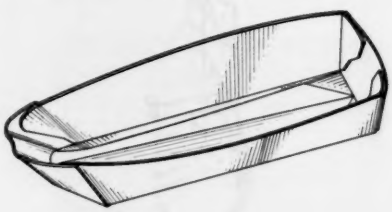


249,216
TABLE FRAME
Werner Blaser, Bottmingen, Switzerland, assignor to Dasu Anstalt, Vaduz, Liechtenstein
Filed Mar. 21, 1975, Ser. No. 560,634
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

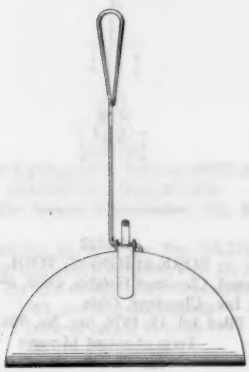
249,217
PORTABLE BACK REST OR SIMILAR ARTICLE
James E. Pierce, 5 Ash La., Ojai, Calif. 93023
Filed Feb. 24, 1976, Ser. No. 660,805
Term of patent 14 years
Int. Cl.[2] D6—*99*
U.S. Cl. D6—200



249,218
SERVING TRAY
Richard Gene Mathison, Newnan, Ga., and Clifford Gustave Peters, Appleton, Wis., assignors to American Can Company, Greenwich, Conn.
Filed Aug. 6, 1976, Ser. No. 712,159
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—5



249,219
TACO SHELL MOLD
Jesse W. Stence, Rte. 1, Box 966, Leander, Tex. 78641
Filed Dec. 6, 1976, Ser. No. 747,949
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—43

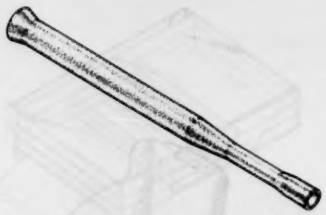


249,220
ROTISSERIE MOTOR OR THE LIKE
Fred H. Bent, 75 York St., Apt. 1606, Kitchener, Ontario, Canada (N2G 1T5)
Filed May 25, 1976, Ser. No. 689,795
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129

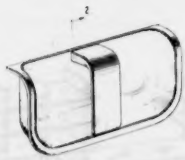
249,221
SPOON OR SIMILAR ARTICLE OF FLATWARE
Ben Seibel, New York, N.Y., assignor to Oxford Hall Silversmiths, Ltd., New York, N.Y.
Filed Aug. 18, 1976, Ser. No. 715,482
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

249,222
BORE-ALIGNING TOOL
Sam S. Melamed, Cleveland Heights, Ohio, assignor to Lempco Industries, Inc., Cleveland, Ohio
Filed Jul. 15, 1976, Ser. No. 705,603
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

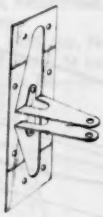
249,223
WIRE GUIDING TUBE
Paul John Holden, 1017 Bienvenida Ave., Pacific Palisades, Calif. 90272
Filed Feb. 18, 1977, Ser. No. 769,856
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14



249,224
HANDLE FOR FURNITURE DOORS, DRAWERS OR THE LIKE
Roland Spellier, Lemgo, Fed. Rep. of Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Herford, Fed. Rep. of Germany
Filed Jan. 30, 1976, Ser. No. 653,862
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1975, 6 AR 138/75
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—313



249,225
DOOR CLOSER BRACKET
Blake F. Moe, 258 N. Shore Dr., South Haven, Mich. 49090
Filed Oct. 29, 1976, Ser. No. 736,953
Term of patent 14 years
Int. Cl. D8—*07, 08*
U.S. Cl. D8—330



249,226
ROTATABLE BOLT-HANGER
Alys Hills, 6647 W. 82nd St., Los Angeles, Calif. 90045; Ronald E. Mari, 13900 Panay Way #5305, Marina Del Rey, Calif. 90291, and Joseph Vulgan, 4703 W. 132 St., Hawthorne, Calif. 90250
Filed Nov. 15, 1976, Ser. No. 741,607
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

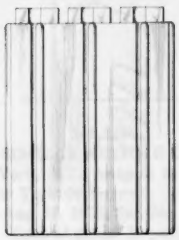
249,227
CLOSET BOLT AND COVER NUT UNIT
Martin E. Ismert III, and Joseph P. Ismert, both c/o Sioux Chief Manufacturing Co., Inc., P.O. Box 282, 4000 Main St., Grandview, Mo. 64030
Filed Jan. 3, 1977, Ser. No. 756,055
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—387

249,228
BOTTLE
Louis Schacher, and Esther Schacher, both of 4910 Fifteenth Ave., Brooklyn, N.Y. 11219
Filed Jul. 21, 1976, Ser. No. 707,228
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—44

249,229
BOTTLE
Louis Schacher, and Esther Schacher, both of 4910 Fifteenth Ave., Brooklyn, N.Y. 11219
Filed Jul. 21, 1976, Ser. No. 707,229
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—44

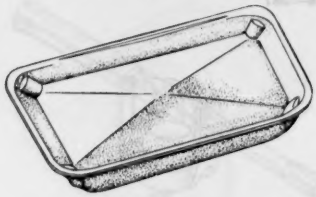
249,230
COMBINED PACKAGING CONTAINER AND TOY CONSTRUCTION BLOCK
Germaine Van Der Veken, Vrijheidslaan 176, 1080 Brussels, Belgium
Filed Jul. 14, 1976, Ser. No. 705,121
Claims priority, application Belgium, Jan. 22, 1976, 5080001
The portion of the term of this patent subsequent to Jul. 12, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—167

249,231
COMBINED PACKAGING CONTAINER AND TOY CONSTRUCTION BLOCK
Germaine Van der Veken, Vrijheidslaan 176, 1080 Brussels, Belgium
Filed Jul. 14, 1976, Ser. No. 705,122
Claims priority, application Belgium, Jan. 22, 1976, 5080002
The portion of the term of this patent subsequent to Jul. 12, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—167

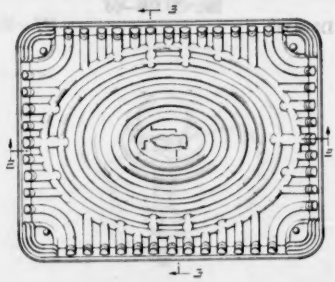


249,232
COMBINED PACKAGING CONTAINER AND TOY CONSTRUCTION BLOCK
Germaine Van der Veken, Vrijheidslaan 176, 1080 Brussels, Belgium
Filed Jul. 14, 1976, Ser. No. 705,299
Claims priority, application Belgium, Jan. 22, 1976, 5080003
The portion of the term of this patent subsequent to Jul. 12, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—167

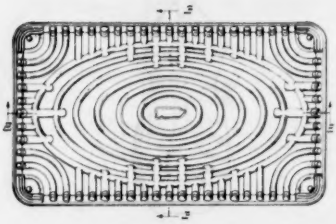
249,233
PACKAGING TRAY OR THE LIKE
John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Nov. 15, 1976, Ser. No. 741,914
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



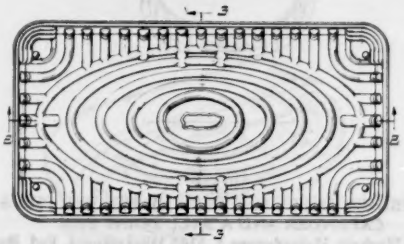
249,234
PACKAGING TRAY
Victor Limon, and Jose M. Ibañez, both of P.O. Box 326, Cidra, P.R. 00639
Filed Dec. 28, 1976, Ser. No. 755,073
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



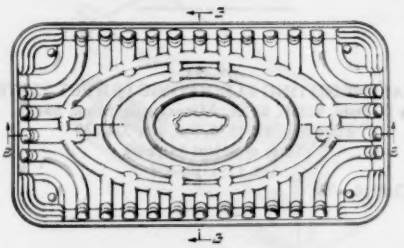
249,235
PACKAGING TRAY
Victor Limon, and Jose M. Ibañez, both of P.O. Box 326, Cidra, P.R. 00639
Filed Dec. 28, 1976, Ser. No. 755,074
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



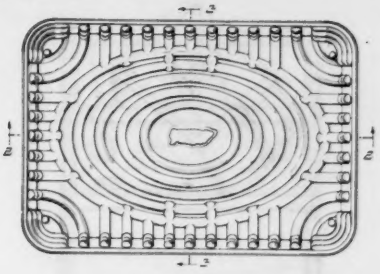
249,236
PACKAGING TRAY
Victor Limon, and Jose M. Ibañez, both of P.O. Box 326, Cidra, P.R. 00639
Filed Dec. 28, 1976, Ser. No. 755,075
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



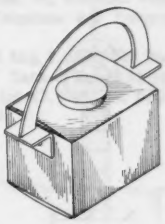
249,237
PACKAGING TRAY
Victor Limon, and Jose M. Ibañez, both of P.O. Box 326, Cidra, P.R. 00639
Filed Dec. 28, 1976, Ser. No. 755,076
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



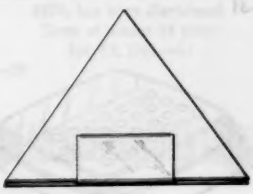
249,238
PACKAGING TRAY
Victor Limon, and Jose M. Ibañez, both of P.O. Box 326, Cidra, P.R. 00639
Filed Dec. 28, 1976, Ser. No. 755,077
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



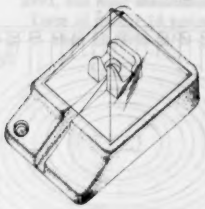
249,239
COMBINED PACKAGING AND CARRYING CONTAINER
LaVern M. Pfeifer, 1153 24th Ave., Columbus, Nebr. 68601
Filed Jul. 12, 1976, Ser. No. 704,201
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222



249,240
JEWELRY BOX
William S. Klitzner, 400 Narragansett Pkwy., Warwick, R.I. 02888
Filed Nov. 1, 1976, Ser. No. 737,854
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—231

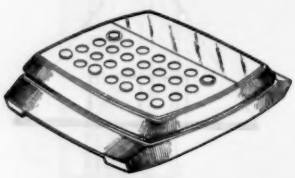


249,241
DISPLAY CONTAINER FOR A SAFETY RAZOR
Lee Halleron, 5725 Charles City Cir., Richmond, Va. 23231
Filed Oct. 15, 1976, Ser. No. 732,875
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—239

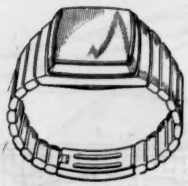


249,242
COMBINED CLOCK AND LAMP
Clarence Williams, 2660 Dwight Rd., Memphis, Tenn. 38114
Filed Dec. 22, 1976, Ser. No. 753,220
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—5

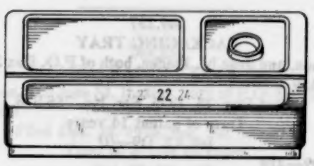
249,243
WRISTWATCH CALCULATOR
Edward E. Salter, Redwood City, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Nov. 12, 1976, Ser. No. 741,328
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—31



249,244
ELECTRONIC WRISTWATCH OR THE LIKE
Edward E. Salter, Redwood City, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Nov. 12, 1976, Ser. No. 741,179
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32

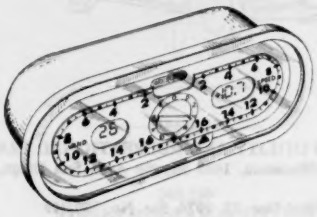


249,245
COMBINED THERMOMETER AND HOLDER FOR A CALENDER AND A BALL POINT PEN
Walter Henkels, Holunderweg 1, 5142 Hückelhoven, Fed. Rep. of Germany
Filed Jun. 22, 1976, Ser. No. 698,321
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, MR 95
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—53

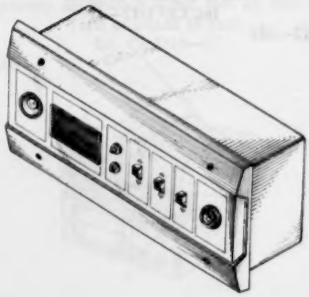


249,246
VISUAL INDICATING ELECTRONIC OUTPUT TESTER
Joseph D. Dahl, 815 E. 51 St., Minneapolis, Minn. 55417
Filed Sep. 17, 1976, Ser. No. 724,339
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

249,247
MULTIPLE DISPLAY SAILING INSTRUMENT
Frederic G. Shotz, c/o International Marine Instrument Inc., Joshua Slocum Dock, Dolphin Cove Quay, Stamford, Conn. 06902; John Hepplewhite, c/o Rhapsody Ltd., 55 Ballingdan St., and Michael Bungay, 43 Landsdown Rd., both of Sudbury, England
Filed Oct. 3, 1975, Ser. No. 619,362
Term of patent 14 years
Int. Cl.[2] D10—*04*
U.S. Cl. D10—98

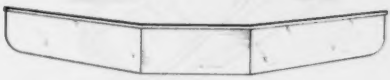


249,248
CONTROL UNIT HOUSING FOR AN ELECTRICAL PROTECTION SYSTEM
Terence E. Gibbs, Pomona, N.Y., assignor to American District Telegraph Company
Filed Feb. 14, 1977, Ser. No. 768,196
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

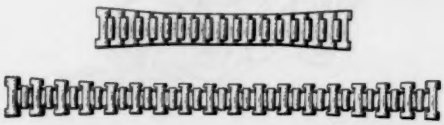


249,249
CONTROL UNIT HOUSING FOR AN ELECTRICAL PROTECTION SYSTEM
Terence E. Gibbs, Pomona, N.Y., assignor to American District Telegraph Company
Filed Feb. 14, 1977, Ser. No. 768,286
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

249,250
COMBINED LIGHT AND SPEAKER HOUSING FOR AN EMERGENCY VEHICLE
Alfred John Peirish, Jr., Fountain Valley, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Aug. 5, 1976, Ser. No. 712,024
Term of patent 14 years
Int. Cl. D10—*06*; D26—*06*
U.S. Cl. D10—114



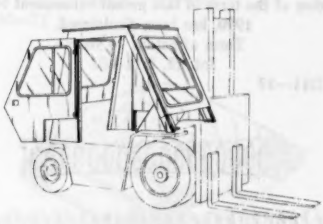
249,251
EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Murray Lawrence Cowan, Norwood, Mass., assignor to Textron Inc.
Filed Jul. 6, 1976, Ser. No. 703,099
The portion of the term of this patent subsequent to Aug. 17, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—19



249,252
CLASP FOR ENGAGING PIERCED EARRING POST
Norman Gatof, New York, N.Y., assignor to Monet Jewelers, Inc., New York, N.Y.
Filed Jul. 27, 1976, Ser. No. 709,054
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—88

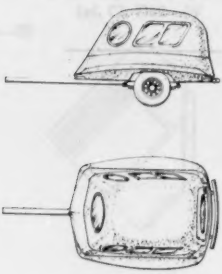
249,253
PENDANT ORNAMENT
Alan D. Watkins, P.O. Box 631, El Dorado, Kans. 67042
Filed Dec. 20, 1976, Ser. No. 752,473
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—128

249,254
LIFT TRUCK CAB
Robert P. Martin, Sr., 7809 W. 130th St., Parma, Ohio 44129
Filed Feb. 17, 1977, Ser. No. 769,540
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—61



249,255
AUTOMOBILE
Hans O. Scherenberg; Werner Breitschwerdt, both of Stuttgart; Bruno Sacco, and Joseph Gallitzendorfer, both of Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Feb. 3, 1977, Ser. No. 765,121
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 4561
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91

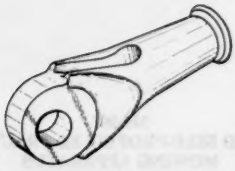
249,256
COMBINED UTILITY AND RECREATIONAL TRAILER
John Joseph Simoneau, 1402 Myrtle Ave., San Diego, Calif. 92103
Filed Dec. 13, 1976, Ser. No. 750,049
Term of patent 14 years
Int. Cl.[2] D12—*10*
U.S. Cl. D12—103



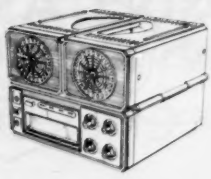
249,257
MOTORCYCLE FAIRING
Thomas S. Beaubien, Rancho Palos Verdes; Harold H. Larsen, Long Beach, and Robert E. Oehring, Norwalk, all of Calif., assignors to Bates Industries, Inc.
Filed Feb. 3, 1977, Ser. No. 765,357
Term of patent 14 years
Int. Cl.[2] D12—*11*
U.S. Cl. D12—182

249,258
MIRROR SUPPORT HOUSING
Richard D. Hutchinson, Jr., Holland; Wayne VandenBrink, and Philip D. Stegenga, both of West Olive, all of Mich., assignors to Donnelly Mirrors, Inc., Holland, Mich.
Filed Aug. 5, 1977, Ser. No. 822,087
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—187

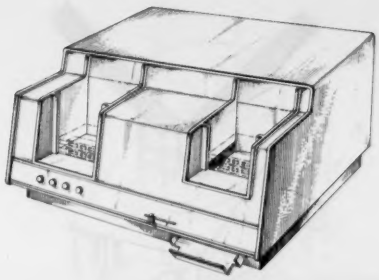
249,259
STRAIN INSULATOR FITTING
Albert Medler, Jackson, Mich., assignor to Plastigage Corporation
Filed Jun. 6, 1977, Ser. No. 803,732
Term of patent 14 years
Int. Cl.[2] D13—*03*
U.S. Cl. D13—18



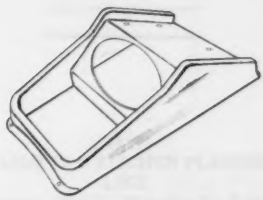
249,260
COMBINED CARTRIDGE RECORDER AND PLAYER
Kashichi Hirota, Hachioji, Japan, assignor to Kyowa Denki Kagaku Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 22, 1976, Ser. No. 707,541
Claims priority, application Japan, Jan. 23, 1976, 51-1645
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



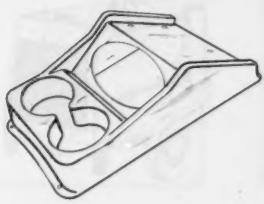
249,261
MULTIPLE CASSETTE RECORDING MACHINE
Arthur J. Pulos, 201 Churchill La., Fayetteville, N.Y. 13066; Paul B. Sweeney, 4658 Broad Rd., Syracuse, N.N.Y. 13224; Michael Cridland, Chatham Rd., Manlius, N.Y. 13104, and Arthur Mikalsen, Knollcrescent Rd., Carmel, N.Y. 10512
Filed Sep. 15, 1976, Ser. No. 723,483
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



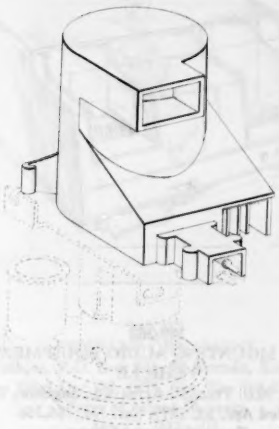
249,262
BASE FOR MOUNTING AUDIO EQUIPMENT IN A VEHICLE
Roy M. Neece, 9828 Tranquil Acres Rd., Saginaw, Tex. 76179
Filed Apr. 11, 1977, Ser. No. 786,356
Term of patent 14 years
Int. Cl. D14—*99;* D12—*16*
U.S. Cl. D14—10



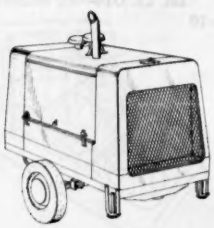
249,263
BASE FOR MOUNTING AUDIO EQUIPMENT IN A VEHICLE
Roy M. Neece, 9828 Tranquil Acres Rd., Saginaw, Tex. 76179
Filed Apr. 11, 1977, Ser. No. 786,506
Term of patent 14 years
Int. Cl. D14—*99;* D12—*16*
U.S. Cl. D14—10



249,264
PUMP COVER
Douglas J. Bingler, Furlong, Pa., assignor to Milton Roy Company, Ivyland, Pa.
Filed Feb. 14, 1977, Ser. No. 768,690
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

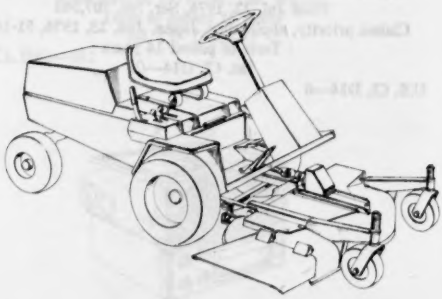


249,265
COMPRESSOR
Shigenobu Nanjo, Yokohama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Jan. 4, 1977, Ser. No. 756,720
Term of patent 7 years
Int. Cl. D15—*02*
U.S. Cl. D15—9

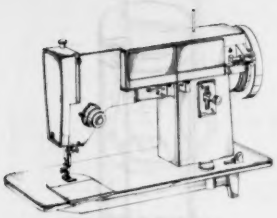


249,266
LAWN MOWER
Akiyasu Furuya, Hatogaya, Japan, assignor to Fuso Keigokin Co., Ltd., Tokyo, Japan
Filed Feb. 24, 1977, Ser. No. 771,668
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—14

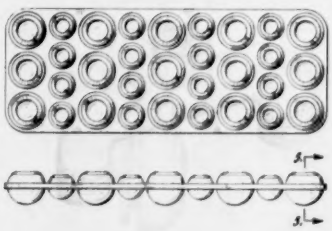
249,267
COMBINED SELF-PROPELLED TRACTOR AND MOWING APPARATUS
John F. Brackin, Minnetonka; Robert D. Lampher, Burnsville; Melvin H. Jendersee, Apple Valley, and James F. Stewart, Shoreview, all of Minn., assignors to The Toro Company, Minneapolis, Minn.
Filed Aug. 1, 1977, Ser. No. 821,294
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—15



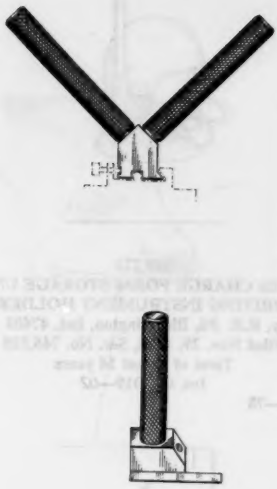
249,268
SEWING MACHINE
Wayne Allen Current, Holmdel, N.J., assignor to The Singer Company
Filed Jan. 10, 1977, Ser. No. 758,119
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69



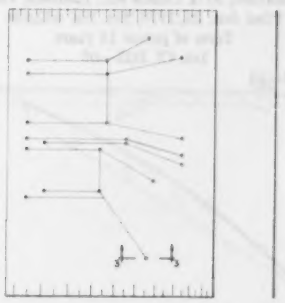
249,269
ICE TRAY
Robert E. Pitts, 6611 E. Central - Suite C, Wichita, Kans. 67206
Filed Feb. 10, 1977, Ser. No. 767,562
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—90



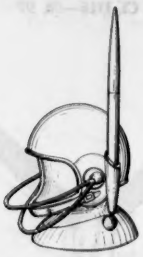
249,270
ADJUSTING HANDLES FOR BASE ASSEMBLY FOR MICROSCOPES
Richard E. Feinbloom, New York, and Laszlo Exdrodi, Elmhurst, both of N.Y., assignors to Designs for Vision, Inc., New York, N.Y.
Filed Jun. 21, 1976, Ser. No. 697,926
Term of patent 14 years
Int. Cl. D16—*06, 99*
U.S. Cl. D16—83



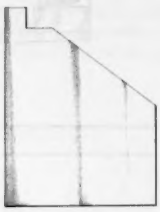
249,271
DRAWING GUIDE FOR KITCHEN PLANNING OR THE LIKE
Joseph M. Boarman, 1814 W. Wyoming St., Indianapolis, Ind. 46221
Filed Dec. 17, 1976, Ser. No. 751,314
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—37



249,272
DESK SET
Louis Sommerfeld, 165 West End Ave., New York, N.Y. 10023
Filed Dec. 10, 1976, Ser. No. 749,553
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75



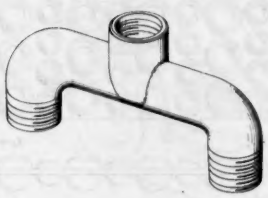
249,273
COMBINED CHARGE FORM STORAGE UNIT AND WRITING INSTRUMENT HOLDER
Ida Janet Day, R.R. #6, Bloomington, Ind. 47401
Filed Nov. 29, 1976, Ser. No. 745,525
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—78



249,274
FISH HOOK REMOVER
Harold L. Hawkins, 5772 Lisbon Rd., Leetonia, Ohio 44431
Filed Jan. 26, 1978, Ser. No. 652,424
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—31

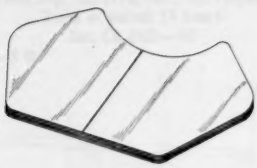
249,275
PORTABLE WATER FILTER
Frederick G. Mackay, Tarzana, and Spencer L. Mackay, Glendale, both of Calif., assignors to Teledyne Industries, Inc.
Filed Mar. 24, 1977, Ser. No. 780,812
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

249,276
Y-TYPE FITTING FOR TWO SHOWERHEADS
Eugene Levin, 1420 Northgate Rd., Colorado Springs, Colo. 80908
Filed Apr. 1, 1976, Ser. No. 672,765
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



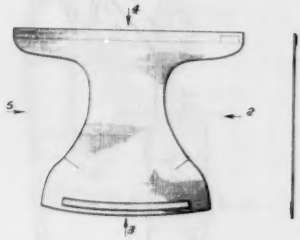
249,277
CONTAINER FOR AIR-TREATING COMPOSITION
Jean-Claude Balland, Marnes la Coquette, and Philippe Lecomte, Plaisance Vouille, both of France, assignors to Ciba-Geigy AG, Basel, Switzerland
Filed Aug. 15, 1975, Ser. No. 604,993
Claims priority, application France, Feb. 19, 1975, 75 1239
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

249,278
FEMALE GONADAL RADIATION SHIELD
Elfriede B. Milligan, Bellevue, Wash., assignor to Lok-A-Bin Systems, Inc., Portland, Oreg.
Filed Jun. 20, 1977, Ser. No. 808,234
Term of patent 14 years
Int. Cl. D24—*99;* D29—*02*
U.S. Cl. D24—2



249,279
EXHAUST VALVE OF RESPIRATORY MASK
Sigurd Alfons Bäcklund, Kemira A 2, SF-65230 Vassa 23, Finland
Filed Feb. 12, 1976, Ser. No. 657,561
Claims priority, application Finland, Sep. 1, 1975, 75469
Term of patent 14 years
Int. Cl. D24—*02;* D23—*01*
U.S. Cl. D24—7

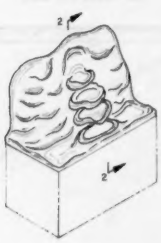
249,280
PINLESS DIAPER
Adolph S. Banuelos, 534 N. Lazar St., San Fernando, Calif. 95695
Filed May 3, 1976, Ser. No. 682,273
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—50



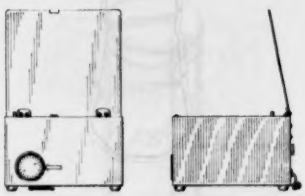
249,281
SMOKING DEVICE
Roger Graham, 931 Selim Rd., Silver Spring, Md. 20910
Filed Jan. 16, 1976, Ser. No. 649,697
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

249,282
WATER PIPE
Stephen J. Nielsen, 2285 E. Skillman, North St. Paul, Minn. 55109
Filed Apr. 6, 1977, Ser. No. 785,072
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

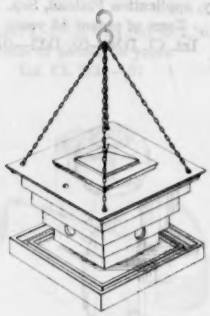
249,283
AQUARIUM COVER
Steven Conte, 17304 Euclid, Fountain Valley, Calif. 92335
Filed Nov. 11, 1977, Ser. No. 850,707
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—12



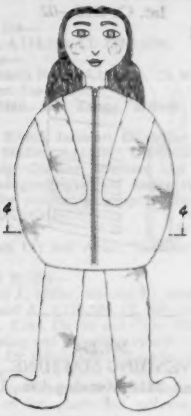
249,284
AUTOMATIC PET FEEDER
Alphonse J. Hericourt, 299 N. Almenar Dr., San Rafael, Calif. 94904
Filed Apr. 21, 1977, Ser. No. 789,596
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



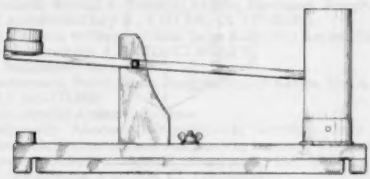
249,285
COLLAPSIBLE BIRD FEEDER
Walter H. Podjan, 1500 Rocky Gap, Benton Harbor, Mich. 49022
Filed Sep. 19, 1977, Ser. No. 834,435
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15



249,286
DOLL
Laura I. O'Connor, 943 Venango Ave., Los Angeles, Calif. 90029
Filed Mar. 7, 1977, Ser. No. 775,266
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

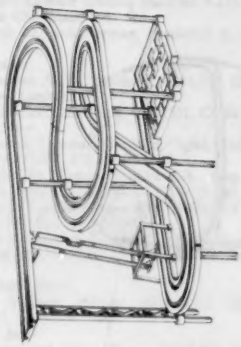


249,287
BALL PROJECTOR BATTING AID
Theodore M. Strout, 24 Sharon La., Wethersfield, Conn. 06109
Filed Sep. 15, 1976, Ser. No. 723,452
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 R



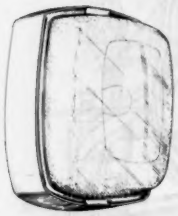
249,288
SET OF CHESS PIECES
Fredric J. Hodkin, 2648 Scott St., Hollywood, Fla. 33020
Filed Mar. 3, 1977, Ser. No. 773,919
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH

249,289
TOY AUTO RACEWAY
Larry R. Burcham, Hendersonville, Tenn., assignor to Kusan, Inc., Nashville, Tenn.
Filed May 3, 1976, Ser. No. 680,331
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 K



249,290
TOY WORK BENCH
Edward M. Ferguson, Nashville, Tenn., assignor to Kusan, Inc., Nashville, Tenn.
Filed Nov. 3, 1976, Ser. No. 736,849
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AC

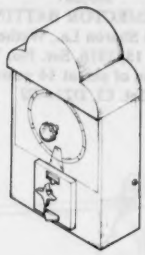
249,291
WIRELESS LIGHT FIXTURE
Whitley Pemberton, Stoughton, Wis., assignor to ESB Ray-O-Vac Management Corporation, Philadelphia, Pa.
Filed Mar. 15, 1976, Ser. No. 666,862
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—4 B



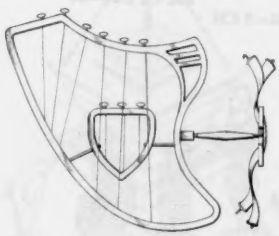
249,292
DESK LAMP
Shoji Ishikawa, Nara; Tadahisa Hatogai, Neyagawa; Osamu Harada, Minou, and Etsuko Kubota, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed May 4, 1977, Ser. No. 793,912
Claims priority, application Japan, Dec. 7, 1976, 51-47886
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 F

249,293
EMERGENCY LIGHT
Masahiko Yamada, and Tadanori Fujiwara, both of Moriguchi, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed Jun. 1, 1977, Ser. No. 802,409
Claims priority, application Japan, Dec. 3, 1976, 51/47802
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R

249,294
VENDING MACHINE
Richard W. Housman, 3416 Manning Ave., Los Angeles, Calif. 90064
Filed Aug. 12, 1976, Ser. No. 713,945
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3 R



249,295
UPPER TORSO ATTACHABLE HARP OR THE LIKE
Walter Pinkins, Jr., 4240 N. Guilford Ave., Indianapolis, Ind. 46205
Filed Nov. 29, 1976, Ser. No. 745,526
Term of patent 14 years
Int. Cl.[2] D17—*03*
U.S. Cl. D56—1 A



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF SEPTEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AAI Corporation: *See*—
Barr, Irwin R., 4,111,360, Cl. 237-1.00A.

AB Fast-Devel: *See*—
Fasth, Ulf Kenneth Folke, 4,111,096, Cl. 85-11.000.

Abbott Laboratories: *See*—
Lee, Cheuk Man; and Zaugg, Harold Elmer, 4,111,942, Cl. 260-293.580.
Winn, Martin; Kyncl, Jaroslav; Dunnigan, Daniel Ambrose; and Jones, Peter Hadley, 4,112,097, Cl. 424-251.000.

Abendroth, Henning; Galinke, Joachim; and Wiemers, Norbert, to Henkel Kommanditgesellschaft auf Aktien. Aqueous adhesion assistant dispersion for producing composite bodies by vulcanization. 4,111,880, Cl. 260-29.6MP.

Abler, Norman C.: *See*—
Golladay, James D.; and Abler, Norman C., 4,111,006, Cl. 66-9.00B.

Abrahamsson, Axel B.: *See*—
Bistrick, Eugene J.; Miller, Stewart F.; Abrahamsson, Axel B.; and Schlaf, Richard A., 4,111,586, Cl. 407-16.000.

Abramson, Carl N.; Kohl, David; and Ogen, Thomas, to Bowne Time Sharing, Inc. Testing and switching system including remotely controllable stations for information transmission and communications networks and systems. 4,112,264, Cl. 179-175.30R.

Abu-Isa, Ismat A., to General Motors Corporation. Synergistic fire retardant additives for plasticized polyvinyl chloride consisting essential of boric acid and zinc oxide or zinc phosphate. 4,111,885, Cl. 260-31.80R.

Access Control Systems Proprietary Limited: *See*—
Varvel, David Anthony; Millar, Frederick William; and Farquharson, Stuart Connall, 4,112,292, Cl. 235-449.000.

ACF Industries, Incorporated: *See*—
Kempl, Willard E.; and Morrison, Bert L., 4,111,396, Cl. 251-328.000.
McClurg, William E.; and Partridge, Charles C., 4,111,393, Cl. 251-174.000.

Acker, Donald J., to J.F. Enterprises, Inc. Convertible sofa-bed unit. 4,110,855, Cl. 5-45.000.

Ackerman, James H., to Sterling Drug Inc. Iodinated anilic acids. 4,111,937, Cl. 260-281.0GN.

Acrison, Incorporated: *See*—
Ricciardi, Ronald J.; Ferrara, Angelo; Hartmann, Joseph L.; and Lauterbach, Gary R., 4,111,272, Cl. 177-50.000.

Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,111,092, Cl. 84-1.270.

Adam, Jean-Marie: *See*—
Hindermann, Peter; Adam, Jean-Marie; and Karlen, Urs, 4,111,966, Cl. 260-373.000.

Adamian, Arnold Aramovich: *See*—
Vishnevsky, Alexandr Alexandrovich; Korolkov, Ivan Alexandrovich; Smirnov, Boris Andreevich; Ivanova, Tatyana Lukyanovna; Adamian, Arnold Aramovich; and Mitkova, Galina Vladimirovna, 4,111,206, Cl. 128-305.000.

Adams, David G., to Norton Company. Woven polyester backed flexible coated abrasive having microballoons in backsize. 4,111,667, Cl. 51-295.000.

Adlerborn, Jan; and Larker, Hans, to ASEA Aktiebolag. Method of manufacturing an object of silicon nitride. 4,112,143, Cl. 427-191.000.

Admiral Corporation: *See*—
Arneson, Blayne E., 4,112,460, Cl. 358-29.000.

Advance Industries Limited: *See*—
Gould, Peter Brian, 4,110,872, Cl. 24-67.110.

Aetna Bearing Company: *See*—
Carlstedt, Richard A., 4,111,290, Cl. 192-98.000.

Affeldt, Karl-Heinz; and Raupach, Gerhard, to Robert Bosch GmbH. Dual-indicator manometer for an electromedical device. 4,111,057, Cl. 73-709.000.

AFP Corporation: *See*—
Louther, William P., Jr., 4,110,946, Cl. 52-223.00R.

Aga, Kiichiro: *See*—
Yamawaki, Takeshi; Hoshijima, Tokitaro; and Aga, Kiichiro, 4,111,039, Cl. 73-81.000.

Agence Nationale de Valorisation de la Recherche (Anvar): *See*—
Trombe, Felix; and Michel, Jacques, 4,111,359, Cl. 237-1.00A.

Agency of Industrial Science and Technology: *See*—
Ichijo, Michio, 4,111,688, Cl. 75-118.00R.
Torikai, Eiichi; Kawami, Youji; Kai, Shinichiro; Namba, Mutsusuke; and Simasaki, Shuhei, 4,111,866, Cl. 521-53.000.

Agfa-Gevaert, N. V.: *See*—
Pollet, Robert Joseph; Vandenberghe, Antoon Leon; Danckaert, Valere Frans; Willems, Jozef Frans; and Van Veelen, George Frans, 4,111,697, Cl. 96-66.500.

Aichinger, Dietmar: *See*—
Obrist, Albert; and Aichinger, Dietmar, 4,111,322, Cl. 215-230.000.

Aigami, Koji: *See*—
Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,111,990, Cl. 260-561.00R.

Ainoura, Masato. Carbide hobbing machine. 4,111,098, Cl. 90-4.000.

Air Products & Chemicals, Inc.: *See*—
Dixon, Dale D.; and Herman, Frederick L., 4,111,877, Cl. 260-29.60R.

Airco, Inc.: *See*—
Carter, Thomas A., Jr., deceased, 4,111,362, Cl. 239-1.000.

Airfix Industries Limited: *See*—
Sutch, Brian Leo Chudleigh, 4,111,622, Cl. 425-112.000.

Ajiki, Nobuo: *See*—
Seko, Maomi; Ogawa, Shinsaku; Ajiki, Nobuo; and Yoshida, Muneo, 4,111,779, Cl. 204-255.000.

Akasaka, Shigeo, to Nippon Kogaku K.K. Stop motion device for motor driven device. 4,112,449, Cl. 354-173.000.

Akashi, Shunji, to Yoshida Kogyo K.K. Method of manufacturing slide fasteners. 4,110,890, Cl. 29-408.000.

Akashi, Shunji, to Yoshida Kogyo K.K. Method of attaching a separable bottom end stop to a pair of slide fastener stringers. 4,110,891, Cl. 29-408.000.

Akatsu, Mitsuharu: *See*—
Nagasaki, Tadashi; Akatsu, Mitsuharu; and Ohtsu, Mitsuo, 4,112,337, Cl. 315-411.000.

Akiya, Fumio: *See*—
Arai, Shigeru; and Akiya, Fumio, 4,111,810, Cl. 210-23.00H.

Aktiebolaget Electrolux: *See*—
Blomberg, Peter Erik, 4,111,004, Cl. 62-476.000.
Fahlvik, Hans Anders; and Fahlvik, Nils Arne, 4,111,654, Cl. 422-26.000.

Akutsu, Yoshio: *See*—
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo; Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, 4,112,260, Cl. 179-18.0FC.

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Parker, Roy B.; and Saindon, Richard R., 4,112,037, Cl. 264-126.000.

Albert Obrist AG: *See*—
Obrist, Albert; and Aichinger, Dietmar, 4,111,322, Cl. 215-230.000.

Albright, Jay Donald: *See*—
Allen, George Rodger, Jr.; Hanifin, John William, Jr.; Moran, Daniel Bryan; and Albright, Jay Donald, 4,112,095, Cl. 424-250.000.

Albright & Wilson Ltd.: *See*—
Cussons, Frank Michael; Mather, Douglas Edward; and Williams, Thomas Alan, 4,112,118, Cl. 423-313.000.

Alderman, Arnold N.; and Dewan, Shashi B., to Firing Circuits, Inc. Power circuit for induction heating. 4,112,286, Cl. 219-10.410.

Alders, Dean: *See*—
Rapson, John Edward; and Alders, Dean, 4,111,276, Cl. 180-117.000.

Aldridge, Clyde L.; and Bearden, Roby, Jr., to Exxon Research & Engineering Co. Staged hydroconversion of an oil-coal mixture. 4,111,787, Cl. 208-10.000.

Alexander, William; and Webb, John T. H., to Wharton Engineers (Elstree) Limited. Haulage winches. 4,111,398, Cl. 254-175.500.

Allen-Bradley Company: *See*—
Crepeau, Robert G.; and Karakis, Thomas G., 4,112,265, Cl. 200-31.00R.
Johnson, Samuel B., 4,110,904, Cl. 29-628.000.
Moffitt, Jerry T.; and Bulgrin, Robert W., 4,112,250, Cl. 338-322.000.

Allen, George Rodger, Jr.; Hanifin, John William, Jr.; Moran, Daniel Bryan; and Albright, Jay Donald, to American Cyanamid Company. 6-Phenyl-1,2,4-triazolo[4,3-b]pyridazine hypotensive agents. 4,112,095, Cl. 424-250.000.

Allen, John B.; and Coale, Cecil R., Jr., to Texas Instruments Incorporated. Laser beam transmitter system for laser beam rider guidance systems. 4,111,383, Cl. 244-3.130.

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Alles, Harold Gene, to Bell Telephone Laboratories, Incorporated. Communication system using intelligent network processor. 4,112,258, Cl. 179-15.0AT.

Allied Chemical Corporation: *See—*
Hoffmann, Robert Joel; Bean, Samuel Louis; Seeling, Philip; and Swaine, James William, Jr., 4,112,061, Cl. 423-512.00A.
Weiss, William Robert; Cooksey, James Judson; and Gordon, Rob Roy, Jr., 4,110,876, Cl. 28-271.000.

Aloisi, Mario J.: *See—*
Smith, Loring E.; and Aloisi, Mario J., 4,111,472, Cl. 292-92.000.

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Alstrin, Charles E.; McClung, Carl L.; and Smith, James C., to Caterpillar Tractor Co. Engine mounted exhaust brake. 4,111,166, Cl. 123-97.00B.

Altman, James E. Fruit sectionizing machine. 4,111,112, Cl. 99-538.000.

Alton Box Board Company: *See—*
Collins, Steven; and Fausett, A. Wayne, 4,111,353, Cl. 229-34.00R.

Aluminum Company of America: *See—*
Stoehr, Robert A.; Ormesher, Robert J.; and Jacobs, Stanley C., 4,111,764, Cl. 204-64.00R.

Alza Corporation: *See—*
Roth, Nathan, 4,111,302, Cl. 206-363.000.
Theeuwes, Felix, 4,111,201, Cl. 128-260.000.
Theeuwes, Felix, 4,111,202, Cl. 128-260.000.
Theeuwes, Felix, 4,111,203, Cl. 128-260.000.

Amana, Okon M.; and Louis, Jean F., to United States of America, Navy. Turbine blade cooling system. 4,111,596, Cl. 415-115.000.

Amberg, Stephen W., to Owens-Illinois, Inc. Apparatus for producing shrunken pilfer-proof neck labels for containers. 4,111,738, Cl. 156-458.000.

Amblard, Paul Alexis: *See—*
Paris, Rene Antoine; Amblard, Paul Alexis; and Rousset, Abel Claude, 4,111,686, Cl. 75-0.50A.

Amcord, Inc.: *See—*
Schmidt, John Kenneth, 4,111,439, Cl. 277-153.000.

Amemori, Hiroyuki; Izumi, Hideki; and Tanaka, Katsuyuki, to Tokico Ltd. Turbine meters. 4,111,046, Cl. 73-231.00R.

American Can Company: *See—*
Hitchler, Edward Willard; and Klein, Albert Joseph, 4,111,721, Cl. 148-2.000.

American Cyanamid Company: *See—*
Allen, George Rodger, Jr.; Hanifin, John William, Jr.; Moran, Daniel Bryan; and Albright, Jay Donald, 4,112,095, Cl. 424-250.000.
Cordes, William Frederick, III, 4,111,873, Cl. 260-23.0XA.
Hlavka, Joseph John, 4,112,219, Cl. 536-17.000.
Weiss, Martin Joseph, 4,111,959, Cl. 260-340.90R.

American Home Products Corporation: *See—*
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,112,094, Cl. 424-250.000.
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,112,101, Cl. 424-263.000.
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,112,106, Cl. 424-270.000.

American Monitor Corporation: *See—*
Denney, Jerry W.; and Long, Robert L., 4,111,657, Cl. 23-230.00B.

American Science and Engineering, Inc.: *See—*
Annis, Martin; Bjorkholm, Paul; Cobb, Carolus M.; Frederick, Edwin; and Ramsey, Alan, 4,112,301, Cl. 250-364.000.

American Screen Printing Equipment Co.: *See—*
Green, Melvin E.; Derrickson, Charles H.; and Lala, Louis A., 4,111,118, Cl. 101-123.000.

American Telephone & Telegraph Co., Inc.: *See—*
Dembiak, Matthew R.; Finnegan, John F.; Reece, Thomas B.; and Rudolph, Howard W., Jr., 4,112,247, Cl. 174-16.00R.

American Thermostat Corporation: *See—*
Hickling, Colin D., 4,112,406, Cl. 337-338.000.

Ametek, Inc.: *See—*
Schmidt, Ferenc J., 4,111,768, Cl. 204-151.000.

Amiad Systems Ltd.: *See—*
Tavor, Chanany, 4,111,607, Cl. 417-46.000.

Amitai, Gavriel: *See—*
Ashani, Yacov; Amitai, Gavriel; Grunfeld, Yona; Kalir, Asher; and Cohen, Sasson, 4,112,082, Cl. 424-209.000.

AMP Incorporated: *See—*
Kwalwasser, William David, 4,111,850, Cl. 252-501.000.
Parmer, Kenneth Ronald; and Little, David Murray, 4,111,512, Cl. 339-105.000.
Peppler, Michael Seigman; and Bakermans, Johannes Cornelis Wilhelmus, 4,110,880, Cl. 29-33.00K.
Shirk, Albert; and Redmond, John Peter, 4,112,139, Cl. 427-54.000.

Anaconda Company, The: *See—*
Shiff, Milo B., 4,112,261, Cl. 179-99.000.

Anand, Joginder N., to Dow Chemical Company, The. Alkali metal/-sulfur battery. 4,112,203, Cl. 429-104.000.

Anderson Development Company: *See—*
Meyer, Jeffrey G., 4,111,839, Cl. 252-431.00P.

Anderson, Paul L.; and Oglia, Thomas F., to Sandoz, Inc. Alpha-cyano-o-anisidino derivatives. 4,112,117, Cl. 424-304.000.

Anderson, William S., to United Technologies Corporation. Detoxification of lead paint. 4,112,191, Cl. 428-497.000.

Andersson, Hans E. B.; and Wladimiroff, Wladimir. Method and apparatus for producing laser pulses with high reproducibility. 4,112,392, Cl. 331-94.5PE.

Andersson, Karl-Gunnar; and Sjostrand, Karl Evert, to ITT Industries, Incorporated. Submersible pump locking system. 4,111,611, Cl. 417-360.000.

Ando, Shigenori, to Seiko Seiki Kabushiki Kaisha. Sealing structure for a bearing. 4,111,500, Cl. 308-187.000.

Andrews, James D., to TRW Inc. Apparatus for drawing glass tubing. 4,111,677, Cl. 65-271.000.

Ang, Leoncio T.: *See—*
Carp, Ralph W.; Ang, Leoncio T.; and Rini, Guy T., 4,111,497, Cl. 303-110.000.

ANIC S.p.A.: *See—*
Sanfilippo, Domenico; and Morelli, Morello, 4,112,007, Cl. 260-666.00A.

Anker-Schiffarts-Gesellschaft mbH & Co. KG: *See—*
Brunker, Dieter, 4,111,354, Cl. 229-62.500.

Annis, Martin; Bjorkholm, Paul; Cobb, Carolus M.; Frederick, Edwin; and Ramsey, Alan, to American Science and Engineering, Inc. Moving particles suspended in a carrier fluid through a flow channel having an input end under gas pressure. 4,112,301, Cl. 250-364.000.

Ansbro, Denis: *See—*
Lawrence, Leslie John; and Ansbro, Denis, 4,112,035, Cl. 264-113.000.

Aono, Shigeo; and Asano, Masaharu, to Nissan Motor Company, Limited. Closed-loop mixture control system for an internal combustion engine using sample-and-hold circuits. 4,111,171, Cl. 123-119.0EC.

Aono, Tetsuya: *See—*
Noguchi, Shunsaku; Aono, Tetsuya; Araki, Yoshiaki; and Kawai, Kiyohisa, 4,111,997, Cl. 260-591.000.

Aoyama, Syuniti; Hayashi, Yoshimasa; and Nakajima, Yasuo, to Nissan Motor Company, Limited. Valve operating mechanism of internal combustion engine. 4,111,165, Cl. 123-90.150.

Arai, Shigeru; and Akiya, Fumio, to Shin-Etsu Chemical Company. Desalination reverse osmotic membranes and their preparation. 4,111,810, Cl. 210-23.00H.

Arakelian, Edward M.; and Maugans, Terrance W., to General Motors Corporation. Push-pull electric switch. 4,112,273, Cl. 200-67.00D.

Araki, Yoshiaki: *See—*
Noguchi, Shunsaku; Aono, Tetsuya; Araki, Yoshiaki; and Kawai, Kiyohisa, 4,111,997, Cl. 260-591.000.

Arcamone, Federico; Bargiotti, Alberto; di Marco, Aurelio; and Penco, Sergio, to Societa' Farmaceutici Italia S.p.A. Epi-daunomycin and epi-adriamycin compounds and method of use. 4,112,076, Cl. 424-180.000.

Arikawa, Yoshijiro: *See—*
Miyagi, Hiroyuki; Nakajima, Fumito; and Arikawa, Yoshijiro, 4,112,297, Cl. 250-288.000.

Arisato, Yasunori: *See—*
Kawagishi, Shigemitsu; and Arisato, Yasunori, 4,111,767, Cl. 204-146.000.

Aritomi, Mitsutoshi, to Mitsubishi Petrochemical Company Limited. Oil-modified alkyd resin composition. 4,111,871, Cl. 260-22.0CB.

Arm, Geoffrey George: *See—*
Gore, Christopher Robert; and Arm, Geoffrey George, 4,112,023, Cl. 260-901.000.

Armour Pharmaceutical Company: *See—*
Rubino, Andrew M.; and Margres, Jack J., 4,112,072, Cl. 424-155.000.

Armstrong Cork Company: *See—*
Buckwalter, Mervin R.; Bulson, Walter T.; Leininger, Larry W.; Posipanko, Thomas; and Ray, Leonard N., Jr., 4,111,646, Cl. 8-2.50A.

Armstrong, Lyle C.: *See—*
Morrison, Robert A.; and Armstrong, Lyle C., 4,112,363, Cl. 324-158.00P.

Arnau, Jose Luis: *See—*
Barrat, Christian Roland; Arnau, Jose Luis; and Wevers, Jean, 4,111,855, Cl. 252-545.000.

Arneson, Blayne E., to Admiral Corporation. Simplified bias and gain adjust system for color cathode ray tube. 4,112,460, Cl. 358-29.000.

Arnold, Willi; Pflughaupt, Rolf; and Felzer, Bertold, to General Motors Corporation. Independent strut type suspension assemblies for vehicles. 4,111,456, Cl. 280-692.000.

Arrowhead Enterprises, Inc.: *See—*
St. Jean, Herbert N., 4,111,390, Cl. 248-274.000.

Artaud, Robert, to Commissariat a l'Energie Atomique. Method of fabrication of uranium oxide UO_2 by the dry processing route and a device for the practical application of the method. 4,112,055, Cl. 423-261.000.

Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH: *See—*
Becker, Willi; and Nesseldreher, Wilfried, 4,111,595, Cl. 415-90.000.

Arya, Satya Prakash; Ballard, Albert Stevens; and Foster, Stephen James, to General Atomic Company. Metering system. 4,111,335, Cl. 222-57.000.

Arzubi, Luis Maria; Gschwendtner, Joerg; and Schnadt, Robert, to International Business Machines Corporation. Semiconductor memory read/write access circuit and method. 4,112,512, Cl. 365-203.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Miyake, Tetsuya; Seko, Maomi; Inada, Kohji; Ochi, Kazushi; and Sakamoto, Tomio, 4,112,044, Cl. 423-7.000.
Seko, Maomi; Ogawa, Shinsaku; Ajiki, Nobuo; and Yoshida, Muneo, 4,111,779, Cl. 204-255.000.
Seko, Maomi; and Miyaki, Tetsuya, 4,112,045, Cl. 423-7.000.
Tsunoda, Kozo; Sowa, Tsuneo; Iitsuka, Kunio; and Sako, Kiyohide, 4,112,221, Cl. 536-24.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Masahiro; and Sawada, Yoshio, 4,112,439, Cl. 354-23.00D.

Kawasaki, Masahiro, 4,112,441, Cl. 354-24.000.

Asakura, Toshiyuki; Itoga, Masaaki; Hayakawa, Takeshi; and Tanimura, Masamitsu, to Toray Industries, Inc. Magnetic recording medium supported on aromatic polyamide. 4,112,187, Cl. 428-474.000.

Asano, Masaharu: *See*—
Aono, Shigeo; and Asano, Masaharu, 4,111,171, Cl. 123-119.0EC.

Asano, Teryoshi; Fukuoka, Sadao; and Sawada, Takashi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Pipe joint locking ring and groove arrangement. 4,111,464, Cl. 285-111.000.

Asars, Juris A.; and Yu, Karl K., to Westinghouse Electric Corp. Display panel with integral memory capability for each display element and addressing system. 4,112,333, Cl. 315-169.0TV.

ASEA Aktiebolag: *See*—
Adlerborn, Jan; and Larker, Hans, 4,112,143, Cl. 427-191.000.
Dahlman, Goran; and Carlsson, Jan-Erik, 4,111,024, Cl. 72-60.000.

Ashani, Yacov; Amitai, Gavriel; Grunfeld, Yona; Kalir, Asher; and Cohen, Sasson, to State of Israel, Prime Minister's Office, The Israel Institute for Biological Research, The. Pharmaceutical composition for treating glaucoma and compound 1,3,2-dioxaphospheringnes. 4,112,082, Cl. 424-209.000.

Ashida, Hitoshi, to Takeda Riken Kogyo Kabushikikaisha. Digital frequency measuring device. 4,112,358, Cl. 324-78.00D.

Asker, Graham Edward, to Eastman Kodak Company. Low-inertia electronic shutter. 4,112,451, Cl. 354-258.000.

Asogawa, Tatsuo: *See*—
Funakoshi, Yoshiro; Asogawa, Tatsuo; Satake, Eiichi; Motoyama, Shimesu; Yamada, Shuri; and Kakukawa, Morio, 4,111,626, Cl. 425-203.000.

Associated Electrical Industries Limited: *See*—
Friedlander, Erich Siegfried, 4,112,403, Cl. 336-12.000.

Atari, Inc.: *See*—
Mayer, Steven T.; and Milner, Ronald E., 4,112,422, Cl. 340-324.0AD.

Atkinson, Joseph George: *See*—
Rooney, Clarence Stanley; Rokach, Joshua; and Atkinson, Joseph George, 4,112,112, Cl. 424-274.000.

Atlantic Richfield Company: *See*—
Zehner, Lee R.; and Lenton, R. Warren, 4,112,245, Cl. 568-864.000.

Audiffred, Sidney J.: *See*—
Pearce, Shairyl I.; and Audiffred, Sidney J., 4,111,071, Cl. 74-753.000.

Augusztin, Bela. Grinding arbor. 4,110,936, Cl. 51-218.00R.

Auphan, Michel Joseph: *See*—
Alais, Pierre; and Auphan, Michel Joseph, 4,112,411, Cl. 340-1.00R.

Auracher, Franz; Zeitler, Karl-Heinz; and Rauscher, Walter, to Siemens Aktiengesellschaft. Device for coupling two light conducting fiber cables. 4,111,522, Cl. 350-96.210.

Auriemma, Robert S. Highway marker. 4,111,581, Cl. 404-10.000.

aus der Funten, Helmut: *See*—
Bier, Gerhard; Blaschke, Franz; aus der Funten, Helmut; and Schade, Gerhard, 4,111,921, Cl. 528-338.000.

Automatic Grinding Machine & Engineering Co. Ltd.: *See*—
Varley, Bernard Scott, 4,111,075, Cl. 76-41.000.

Automotive Products Limited: *See*—
Farrant, David John Rowland, 4,111,571, Cl. 403-27.000.
Young, Alastair John, 4,111,494, Cl. 303-6.00C.

Avery International Corporation: *See*—
Nemeth, Suzette B., 4,111,205, Cl. 128-284.000.

AVM Corporation: *See*—
Sheppard, William L., 4,111,395, Cl. 251-306.000.

Avtex Fibers Inc.: *See*—
Franko-Filipasic, Borivoj Richard; Orwoll, Edward F.; and Patel, Vithal C., 4,111,701, Cl. 106-15.0FP.

B. F. Goodrich Company, The: *See*—
Black, Arthur Leroy, 4,111,897, Cl. 260-42.330.

B & G Equipment Company: *See*—
Brehm, William L., 4,111,368, Cl. 239-394.000.

Babcock, Robert A.; Glasfeld, Rolf D.; and Holt, Luther E., to General Dynamics Corporation. Tank support joint. 4,111,146, Cl. 114-74.00A.

Babinsky, Andrew D., to Diamond Shamrock Corporation. Converting a diaphragm electrolytic cell to a membrane electrolytic cell. 4,112,149, Cl. 427-34.000.

Bachman, Gerald L., to Monsanto Company. Hydrolysis of esters of α-L-aspartyl-L-phenylalanine. 4,111,925, Cl. 260-112.50R.

Back, Paul R.; and Van Vessem, Thomas G., to United Technologies Corporation. Dual threshold low coil signal conditioner. 4,112,351, Cl. 324-16.00R.

Back, Paul R.: *See*—
Van Vessem, Thomas G.; and Back, Paul R., 4,112,350, Cl. 324-16.00R.

Baddour, Raymond F., to Energy Resources Co. Inc. Recovering surfactant. 4,111,812, Cl. 210-257.00M.

Badertscher, Ernest; and Easton, George Anthony, to Societe d'Assistance Technique pour Produits Nestle S.A. Butter-like food product. 4,112,132, Cl. 426-603.000.

Baggett, Joseph M.; and Ham, George E., to Dow Chemical Company, The. Heat stabilized thermoplastic resins containing compounds with phosphorus to phosphorus bonds. 4,111,899, Cl. 260-45.80R.

Baggett, Joseph M., to Dow Chemical Company, The. Polycarbonates having carbamate terminal groups. 4,111,910, Cl. 528196-.

Bahder, George; Eager, George S., Jr.; and Suarez, Rafael, to General Cable Corporation. Mobile bridge test apparatus and method utilizing a sub-power frequency test signal for cable system evaluation. 4,112,354, Cl. 324-54.000.

Bailey, Allen R., to U.S. Rubber Reclaiming Co., Inc. Ground rubber elastomeric composite useful in surfacings and the like, and methods. 4,112,176, Cl. 428-304.000.

Bailey, C. Richard. Apparatus for concealing auxiliary equipment and methods of constructing and utilizing same. 4,111,133, Cl. 108-45.000.

Bailey, Frederick Eugene; and Koleske, Joseph Victor, to Union Carbide Corporation. Impact modifiers for polyvinyl chloride. 4,111,876, Cl. 260-29.6RB.

Bailey, John M., to Monitoring Systems Inc. Hydrostatic head pressure monitor with remote readout. 4,111,047, Cl. 73-302.000.

Baird, David Boyd; Campbell, James Stanley; Fishwick, Brian Ribbons; and McClelland, Robert David, to Imperial Chemical Industries Limited. Process for the manufacture of heterocyclic compounds. 4,111,956, Cl. 260-329.0AM.

Baird, William G., Jr.; Holbrook, Stanley E.; and Platt, Jeremy A., deceased, to W. R. Grace & Co. Method for preparing a film of vinylidene chloride polymer. 4,112,181, Cl. 428-336.000.

Bakelite Xylonite Limited: *See*—
Jack, James, 4,111,860, Cl. 521-84.000.

Baker, Roger Thomas. Dynamic memory cell with automatic refreshing. 4,112,510, Cl. 365-187.000.

Bakermans, Johannes Cornelis Wilhelmus: *See*—
Peppler, Michael Seigman; and Bakermans, Johannes Cornelis Wilhelmus, 4,110,880, Cl. 29-33.00K.

Bakker, Jouke, to Douwe Egberts Tabaksmaatschappij B.V. Dosing and weighing of cut tobacco. 4,111,212, Cl. 131-21.00A.

Balatinecz, John J. Producing recycle composition paper flake board. 4,111,730, Cl. 156-62.200.

Baldwin, John J.: *See*—
Novello, Frederick C.; and Baldwin, John J., 4,111,944, Cl. 260-296.00R.

Balke, David E.; and Perez, Donald E., to Ciba-Geigy Corporation. Process for the preparation of methyliminoisobutyrate hydrochloride. 4,111,976, Cl. 260-453.0RW.

Ball Packaging Products, Inc.: *See*—
Zappia, Anthony T., 4,111,674, Cl. 65-77.000.

Ballard, Albert Stevens: *See*—
Arya, Satya Prakash; Ballard, Albert Stevens; and Foster, Stephen James, 4,111,335, Cl. 222-57.000.

Ballard, Geoffrey Martin, to Pilkington Brothers Limited. Thermal treatment of glass in a fluidized bed. 4,111,675, Cl. 65-114.000.

Bamberg, Wolfgang: *See*—
Schmidt, Joachim; Weigelt, Christian; Bamberg, Wolfgang; and Schneider, Wolfgang, 4,111,987, Cl. 562-401.000.

Ban, Thomas E.; and Rao, Ashok D., to McDowell-Wellman Engineering Company. Method of producing pelletized fixed sulfur fuel. 4,111,755, Cl. 201-6.000.

Bangay, Alan John; Raw, Peter Michael; Llewellyn, Rees Jenkin; and Gregory, Peter, to BICC Limited. Fabrication of copper. 4,110,892, Cl. 29-420.000.

Baniak, Zofia: *See*—
Swietoslawski, Janusz; Silowiecki, Andrzej; Ratajczak, Aleksander; Nocon, Barbara; and Baniak, Zofia, 4,112,242, Cl. 568-726.000.

Banister, Peter George, to Conwed Corporation. Resilient foam cushion structure. 4,110,857, Cl. 5-337.000.

Bannister, Ramon A. Method of inhibiting corrosion. 4,111,830, Cl. 422-17.000.

Bantz, Paul Edward; and Mayer, Robert William, to Globe-Union Inc. Ladle gate. 4,111,256, Cl. 164-335.000.

Banwell, Richard Hugh: *See*—
Hincklieff, Henry Russell; and Banwell, Richard Hugh, 4,111,211, Cl. 131-2.000.

Baranow, Sanford, to Special Metals Corporation. Dispersion-strengthened cobalt-bearing metal. 4,111,685, Cl. 75-951.000.

Barben, Theodore R., II, to Thomas Barben Instruments. Electrochemical reference cell with improved liquid junction. 4,112,352, Cl. 324-30.00R.

Barbini, Richard J., to Chemineer, Inc. Motionless mixer. 4,111,402, Cl. 366-338.000.

Barbosa, Ely Rubens. Game of naval strategy and chance. 4,111,428, Cl. 273-262.000.

Bardos, Andrew Miklos: *See*—
Gillis, Alva Knox; Otten, Thomas Harvey; and Bardos, Andrew Miklos, 4,111,519, Cl. 350-3.660.

Bargiotti, Alberto: *See*—
Arcamone, Federico; Bargiotti, Alberto; di Marco, Aurelio; and Penco, Sergio, 4,112,076, Cl. 424-180.000.

Barnette, Jon H., to United States of America, Energy. Manually operated coded switch. 4,111,017, Cl. 70-293.000.

Barr, Irwin R., to AAI Corporation. Solar energy concentrating and collecting arrangement and method. 4,111,360, Cl. 237-1.00A.

Barrat, Christian Roland; Arnau, Jose Luis; and Wevers, Jean, to Procter & Gamble Company, The. Liquid enzyme containing detergent composition. 4,111,855, Cl. 252-545.000.

Barre, Francoise: *See*—
Dubois, Jean Claude; and Barre, Francoise, 4,112,239, Cl. 560-73.000.

Bartell, Roger Edwin: *See*—
Salsich, Robert Charles; and Bartell, Roger Edwin, 4,112,280, Cl. 219-216.000.

Barthe, Marie-Pierre: *See*—
Battigelli, Jean A.; and Barthe, Marie-Pierre, 4,111,672, Cl. 65-3.00C.

Bartus, Stephen P., Jr.: *See*—
Motter, Theodore J.; Mattimoe, Paul T.; and Bartus, Stephen P., Jr., 4,112,171, Cl. 428-213.000.

Barwick, Morris L., to Xerox Corporation. Means and method for providing indicating of end portion of web material. 4,111,378, Cl. 242-57.000.

Barzda, Justin J., to United States of America, Navy. Deployable rotor. 4,111,602, Cl. 416-89.000.

Baschang, Gerhard; Sele, Alex; Stanek, Jaroslav; and Rossi, Alberto, to Ciba-Geigy Corporation. Furanose-O-pyridylcarboxylic acid esters. 4,112,075, Cl. 424-180.000.

BASF Aktiengesellschaft: *See—*
Sander, Bruno; Bonitz, Eckhard; and Scherling, Kurt, 4,112,029, Cl. 264-11.000.

BASF Wyandotte Corporation: *See—*
Login, Robert Bernard, 4,111,816, Cl. 252-8.600.

Bassoe, Jorgen: *See—*
Jorgensen, Arne; Berthelsen, Poul; and Bassoe, Jorgen, 4,111,352, Cl. 229-31.00R.

Battelle Development Corporation: *See—*
Peterson, Palmer L.; Duffy, James B.; and Tokarz, Richard D., 4,111,798, Cl. 209-172.500.

Battelle Memorial Institute: *See—*
Zega, Bogdan, 4,112,137, Cl. 427-38.000.

Battigelli, Jean A.; and Barthe, Marie-Pierre, to Saint-Gobain Industries. Method and apparatus for suppression of pollution in mineral fiber manufacture. 4,111,672, Cl. 65-3.00C.

Bauer, Jochen: *See—*
Pasternak, Rudolf; and Bauer, Jochen, 4,111,665, Cl. 48-77.000.

Bauer, John R., to Goodyear Tire & Rubber Company, The. Sidewall protector. 4,111,250, Cl. 152-187.000.

Baum, Burton M.: *See—*
Blumbergs, John H.; Finley, Joseph H.; and Baum, Burton M., 4,111,651, Cl. 8-111.000.

Baumgartner, Franklin: *See—*
Liu, James, 4,111,689, Cl. 75-122.000.

Baupres AG: *See—*
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Baxter, Ronald Dale, to Leeds & Northrup Company. Small-size high-performance radiation thermopile. 4,111,717, Cl. 136-225.000.

Baxter Travenol Laboratories, Inc.: *See—*
Bellamy, David; and Winchell, David A., 4,111,325, Cl. 215-232.000.
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de Cleur, Eckhard; Dhein, Rolf; Rudolph, Hans; and Kreuder, Hans Joachim, 4,112,012, Cl. 260-835.000.
Eckert, Heiner; Ugi, Ivar; and Kabbe, Hans-Joachim, 4,111,933, Cl. 260-239.100.
Enders, Edgar; Stendel, Wilhelm; and Voege, Herbert, 4,112,065, Cl. 424-45.000.
Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, 4,111,918, Cl. 528-73.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammen, Ingeborg; and Homeyer, Bernhard, 4,112,080, Cl. 424-200.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,112,081, Cl. 424-200.000.
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Martin, Manfred; Schmidt, Walter; and Scharfe, Gerhard, 4,111,967, Cl. 260-396.00R.
Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,112,109, Cl. 424-273.00P.
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Rohbock, Klaus; Wiemers, Rudolf; Woditsch, Peter; and Thiel, Reinhard, 4,111,832, Cl. 252-412.000.
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BBC Brown, Boveri & Company Limited: *See—*
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Beard, Charles D.; and Moffitt, Robert B., III, to Union Carbide Corporation. Cleavage of silylated carboranes and method for preparing meta-carborane employing same. 4,111,999, Cl. 260-606.50B.

Bearden, Roby, Jr.: *See—*
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Bechteler, Martin: *See—*
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Beck, Warren R., to Minnesota Mining and Manufacturing Company. Hollow spheres. 4,111,713, Cl. 106-288.00B.

Becker, Kenneth W.: *See—*
Sullivan, Daniel S., 3rd; Strubelt, Charles E.; and Becker, Kenneth W., 4,112,001, Cl. 568-855.000.

Becker, Willi; and Nesseldreher, Wilfried, to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH. Turbomolecular pump with magnetic mounting. 4,111,595, Cl. 415-90.000.

Beckman Instruments, Inc.: *See—*
Ishimaru, Kenzo, 4,111,355, Cl. 233-20.00R.

Beckmann, Klaus; and Linke, Horst, to Gewerkschaft Eisenhutte Westfalia. Stacked mineral mining plows independently driven or coupled. 4,111,489, Cl. 299-34.000.

Becton, Dickinson and Company: *See—*
Percarpio, Edward P., 4,111,326, Cl. 215-247.000.

Beeby, Philip J., to Syntex (U.S.A.) Inc. Cephalosporin type antibacterials having a substituted propenyl group in the 3-position. 4,112,087, Cl. 424-246.000.

Beede, Charles H.; Waldman, Harold L.; and Blumig, Theodore, to Johnson & Johnson. Hydrophilic random interpolymer from quaternary ammonium monomers and method for making same. 4,111,922, Cl. 526-292.000.

Begany, Albert J.: *See—*
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,112,094, Cl. 424-250.000.
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Bein, Kenneth E. Holding means for gem stones. 4,110,937, Cl. 51-229.000.

Bell Fibre Products Corporation: *See—*
Geschwender, Robert C., 4,111,862, Cl. 521-55.000.

Bell & Howell Company: *See—*
Wells, Thomas R., 4,111,149, Cl. 353-78.000.
Wells, Thomas R.; and Dahlen, Theodore E., 4,111,537, Cl. 353-101.000.

Bell, Malcolm R.: *See—*
Gelotte, Karl O.; Zalay, Andrew W.; and Bell, Malcolm R., 4,111,946, Cl. 260-297.00R.

Bell, Malcolm Rice: *See—*
Carlson, John Alan; and Bell, Malcolm Rice, 4,112,105, Cl. 424-270.000.

Bell Telephone Laboratories, Incorporated: *See—*
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Bindell, Jeffrey Bruce; Holschwandner, Lowell Henry; Labuda, Edward Franklin; and Ryden, William Dennis, 4,111,783, Cl. 204-298.000.
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Cho, Alfred Yi; DiLorenzo, James Vincent; and Mahoney, Gerard Edward, 4,111,725, Cl. 148-175.000.
Kaminow, Ivan Paul; and Kogelnik, Herwig Werner, 4,111,523, Cl. 350-96.140.
Kaminow, Ivan Paul; and Presby, Herman Melvin, 4,111,525, Cl. 350-96.310.
Stiefel, Kenneth Erwin, 4,112,262, Cl. 179-170.00G.
Tomlinson, Walter John, III, 4,111,524, Cl. 350-96.190.

Bellamy, David; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Sealed closure for plastic container with interlocking protective outer closure. 4,111,325, Cl. 215-232.000.

Beloit Corporation: *See—*
Cancilla, Vincent W., 4,111,799, Cl. 209-273.000.

Bemrose, Harold E. Forced air food drier. 4,110,916, Cl. 34-197.000.

Bendiks, Donald J. Flat television screen. 4,112,466, Cl. 358-241.000.

Bendix Autolite Corporation: *See—*
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Bendix Corporation, The: *See—*
Carp, Ralph W.; Ang, Leoncio T.; and Rini, Guy T., 4,111,497, Cl. 303-110.000.
Jordan, David D., 4,111,576, Cl. 403-134.000.
Muhs, Donald Paul; and Hart, Russell Frank, 4,112,413, Cl. 340-27.00R.

Bendix Machine Tool Corporation: *See—*
Hipwell, Donald D.; and Menzel, Klaus Rudolf, 4,110,897, Cl. 29-568.000.

Benko, John M., to Pullman Incorporated. Flame cutting machine for modification of railway car side sills. 4,111,404, Cl. 266-58.000.

Benninger, Hans; Eggimann, Fritz; and Enkegaard, Ole, to Patelhold Patentverwertungs & Elektro-Holding AG. Ground fault protection system. 4,112,476, Cl. 361-42.000.

Benno, Edward Leonard: *See—*
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Benoit, Roland A.; and Guillot, Edmond P., to InterRoyal Corporation. Hospital bed. 4,110,856, Cl. 5-68.000.

Bentz, Francis: *See—*
Kunzel, Hans Egon; and Bentz, Francis, 4,111,920, Cl. 526-6.000.

Bepex Corporation: *See*—
Cory, Charles E., 4,111,115, Cl. 100-116.000.

Berges, David A., to SmithKline Corporation. 7β-Acylamino-3-(phosphonoalkyl and esterified phosphonoalkyl substituted tetrazolylthiomethyl)cephalosporins. 4,112,086, Cl. 424-246.000.

Berges, David A., to SmithKline Corporation. 7-Acyl-3-(sulfoalkyl substituted oxadiazolylthiomethyl) cephalosporins. 4,112,088, Cl. 424-246.000.

Berghahn, Walter G.; and Weinstein, Jack, to Bristol-Myers Company. Liquid applicator. 4,111,567, Cl. 401-202.000.

Bergman, Ernest R., to Copeland Corporation. Discharge muffler. 4,111,278, Cl. 181-249.000.

Bergmann, Horst, to Siemens Aktiengesellschaft. Apparatus and method for tuning electro-mechanical filter components. 4,112,360, Cl. 324-80.000.

Bernal G., Enrique, to Honeywell Inc. Fabrication of optical waveguides. 4,111,520, Cl. 350-96.120.

Bernauer, Lawrence J.: *See*—
Fenton, Alvin P.; Gault, Roger T.; and Bernauer, Lawrence J., 4,111,176, Cl. 123-198.0DB.

Berney, Jean Claude. Control for a step motor for the measurement of time. 4,110,968, Cl. 58-23.00A.

Bernstein, Jack: *See*—
Hoehn, Hans; Bernstein, Jack; and Vogt, Berthold Richard, 4,111,940, Cl. 260-293.600.

Berol Kemi AB: *See*—
Weibull, Bengt John Gustaf; and Thorsell, Leif Urban Folke, 4,112,231, Cl. 544-174.000.

Berstermann, Wilhelm: *See*—
Grisar, Ulrich; and Berstermann, Wilhelm, 4,111,556, Cl. 356-86.000.

Berthelsen, Poul: *See*—
Jorgensen, Arne; Berthelsen, Poul; and Bassoe, Jorgen, 4,111,352, Cl. 229-31.00R.

Berthold, Richard: *See*—
Bormann, Gerhard; and Berthold, Richard, 4,112,111, Cl. 424-274.000.

Bertolasi, Robert B., to Kelsey-Hayes Co. Dual-screen data display terminal for data processing units. 4,112,423, Cl. 340-324.0AD.

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Bertolette, Reed, 4,111,346, Cl. 225-96.500.

Bertolette, Reed, to Bertolette Machines, Inc. Tube cutting machine with break-off means. 4,111,346, Cl. 225-96.500.

Bertsch, Hugh C.: *See*—
Chapman, Douglas W.; and Bertsch, Hugh C., 4,112,238, Cl. 560-70.000.

Berwick, Martin Alfred: *See*—
Wright, Hal Eldon; and Berwick, Martin Alfred, 4,111,693, Cl. 96-1.600.

BesPak Corporation: *See*—
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Best, Donald Charles, to Union Carbide Corporation. Nickel-rhenium hydrogenation catalyst and methods of preparing same and using same. 4,111,840, Cl. 252-432.000.

Betancourt, Osmundo J.: *See*—
Jay, John; Bonner, Gary D.; and Betancourt, Osmundo J., 4,111,801, Cl. 210-40.000.

Bettencourt, Darryl G.: *See*—
Freeman, Daniel L.; Bettencourt, Darryl G.; and Marshall, George E., Jr., 4,111,210, Cl. 130-30.00R.

Bevan, Leonard Graham: *See*—
Pairaudeau, Reginald David; Turnbull, David; and Bevan, Leonard Graham, 4,111,710, Cl. 106-90.000.

Beverly Limited: *See*—
Kent, Jan Herbert Farquharson, 4,111,619, Cl. 425-43.000.

Bevins, Bruce V.: *See*—
Shanto, Albert J.; and Bevins, Bruce V., 4,111,213, Cl. 131-173.000.

Bezstarosti, Ladislav; Lindental, Antonin; Lanta, Jiri; and Cizek, Jaroslav, to Vyzkumny ustav bavlnarsky. Apparatus for controlling shed formation in a travelling-wave loom. 4,111,238, Cl. 139-436.000.

BICC Limited: *See*—
Bangay, Alan John; Raw, Peter Michael; Llewellyn, Rees Jenkin; and Gregory, Peter, 4,110,892, Cl. 29-420.000.

Bicking, John B.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. Interphenylene 8-aza-9-dioxothia-11,12-secoprostaglandins. 4,112,236, Cl. 560-12.000.

Biegel, Peter; and Dumont, Anton, to Klockner-Humboldt-Deutz Aktiengesellschaft. Apparatus for the treatment of the outer contour of a worm conveyor. 4,111,403, Cl. 266-58.000.

Bier, Gerhard; Blaschke, Franz; aus der Funten, Helmut; and Schade, Gerhard, to Dynamit Nobel Aktiengesellschaft. Transparent polyamides. 4,111,921, Cl. 528-338.000.

Bilger, Alan H.: *See*—
Davis, Donald Colen; Bilger, Alan H.; and Madson, Kent Christ, Jr., 4,111,778, Cl. 204-195.00S.

Bimond, Jean-Pierre; and Lazarre, Flavien, to Societe Nationale Elf Aquitaine (Production). Device for destroying foam. 4,111,829, Cl. 252-361.000.

Bindell, Jeffrey Bruce; Holschwandner, Lowell Henry; Labuda, Edward Franklin; and Ryden, William Dennis, to Bell Telephone Laboratories, Incorporated. Triode sputtering system. 4,111,783, Cl. 204-298.000.

Binder, Kerry: *See*—
King, M. Dale; and Binder, Kerry, 4,111,274, Cl. 180-25.00R.

Biola, Georges: *See*—
Masotti, Robert; Biola, Georges; and Guerpillon, Henri, 4,111,662, Cl. 422-231.000.

Biondetti, Mario, to Escher Wyss Limited. Rolling device having a controlled-deflection roll. 4,111,746, Cl. 162-272.000.

Bistrick, Eugene J.; Miller, Stewart F.; Abrahamsson, Axel B.; and Schlaf, Richard A., to Lear Siegler, Inc. Broach. 4,111,586, Cl. 407-16.000.

Bivens, David J., to Bivens-Winchester Corporation. Adjustable width side brush arrangement for large vehicle washing machines. 4,110,865, Cl. 15-53.0AB.

Bivens-Winchester Corporation: *See*—
Bivens, David J., 4,110,865, Cl. 15-53.0AB.

BJ-HUGHES Inc.: *See*—
Gray, Charles Alexander, 4,111,235, Cl. 138-109.000.

Bjorkholm, Paul: *See*—
Annis, Martin; Bjorkholm, Paul; Cobb, Carolus M.; Frederick, Edwin; and Ramsey, Alan, 4,112,301, Cl. 250-364.000.

Blachura, Leon, to North Oakland Development Corporation. Home building method. 4,110,952, Cl. 52-745.000.

Black, Arthur Leroy, to B. F. Goodrich Company, The. EPDM composition. 4,111,897, Cl. 260-42.330.

Black Clawson Company, The: *See*—
Tetro, Richard S.; and Harmon, Paul E., 4,111,377, Cl. 242-56.00R.

Black, John W., to Pemco-Kalamazoo, Inc. Apparatus for assembling bearing unit in a wheel. 4,111,623, Cl. 425-129.00R.

Blackburn, Keith; and Ross, Douglas, to Dock Truck, Inc. Terminal tractor. 4,111,273, Cl. 180-14.00R.

Blackmer, David E., to DBX, Inc. Signal compander system. 4,112,254, Cl. 179-1.0VL.

Blair, Ronald A.; Nickstadt, Gerhard A.; and Imbrogno, Gaetano O., to General Electric Company. Drive motor mounting base for a gear motor having a C-faced reducer. 4,111,069, Cl. 74-606.00R.

Blake, Joseph Walter, III: *See*—
Einhorn, Ruediger; Chasen, Lee Richard; and Blake, Joseph Walter, III, 4,110,907, Cl. 30-164.950.

Blanch, Julian E.: *See*—
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Blaschke, Franz: *See*—
Bier, Gerhard; Blaschke, Franz; aus der Funten, Helmut; and Schade, Gerhard, 4,111,921, Cl. 528-338.000.

Blaszyk, Paul E.; Shoup, Robert D.; and Wein, William J., to Corning Glass Works. Silica-containing porous bodies of controlled pore size. 4,112,032, Cl. 264-42.000.

Blatner, Eduard: *See*—
Kob, Adolf; and Blatner, Eduard, 4,111,457, Cl. 280-728.000.

Blattner, Hans, to Ciba-Geigy Corporation. Oxygenated azatetracyclic compounds. 4,112,110, Cl. 424-274.000.

Blau, Henry H., Jr.; and Kebabian, Paul L., to Environmental Research & Technology, Inc. Method of making a light equalizer. 4,111,731, Cl. 156-86.000.

Blau, Henry H., Jr.; and Kebabian, Paul L., to Environmental Research & Technology, Inc. Light equalizer and method of making same. 4,112,028, Cl. 264-1.000.

Blomberg, Peter Erik, to Aktiebolaget Electrolux. Gas operated refrigerator having a sealed combustion system with separated fresh air and combustion gas conduits. 4,111,004, Cl. 62-476.000.

Bluestein, Ben A., to General Electric Company. Process for producing a cyclotrisiloxane in a cracking reaction. 4,111,973, Cl. 260-448.20E.

Blumbergs, John H.; Finley, Joseph H.; and Baum, Burton M., to FMC Corporation. Sulfonic anhydrides in peroxygen bleaching. 4,111,651, Cl. 8-111.000.

Blumig, Theodore: *See*—
Beede, Charles H.; Waldman, Harold L.; and Blumig, Theodore, 4,111,922, Cl. 526-292.000.

Bo Moderatho & Company AB: *See*—
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Bob Mallard Enterprises, Inc.: *See*—
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Bockelmann, Wolfgang: *See*—
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Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Tamm, Rolf, 4,111,563, Cl. 356-244.000.
Tamm, Rolf Gunther Arnold; and Huber, Bernhard Werner, 4,111,051, Cl. 73-423.00A.

Bodlaj, Viktor, to Siemens Aktiengesellschaft. Apparatus and method for measuring distance from and speed components of an object traveling vertical to a reference line. 4,111,552, Cl. 356-4.000.

Bodolai, John J., to Carborundum Company, The. Cuprous oxide containing resin bonded abrasive article and process for manufacturing same. 4,110,939, Cl. 51-298.00R.

Boeing Company, The: *See*—
Falcioni, Joseph G., 4,111,580, Cl. 85-9.00R.
Geithman, Glenn Allen; and Woodmansee, Wayne Earl, 4,111,053, Cl. 73-588.000.
Hilliard, Lonnie George; and Verzemnieks, Juris, 4,111,081, Cl. 181-290.000.
Roman, Stephan; and Spitko, Richard J., 4,111,605, Cl. 416-141.000.

Boer, Melle; and Rentema, Albertus Pieter, to U.S. Philips Corporation. Shaving head for a dry-shaving apparatus. 4,110,906, Cl. 30-43.920.

Boessler, Hanns; and Rauch, Hubert, to Rohm GmbH. Copolymeric resin binder powders. 4,112,215, Cl. 528-503.000.

Boesten, Wilhelmus H. J., to Stamicarbon, B.V. Process for preparing optically active phenyl glycine. 4,111,980, Cl. 562-401.000.

Boggs, Daniel R.; and Brown, Richard I., to Baxter Travenol Laboratories, Inc. Centrifugal apparatus with flexible sheath. 4,111,356, Cl. 233-26.000.

Bolin, Philip C., to Westinghouse Electric Corp. High current contact assembly. 4,111,511, Cl. 339-64.00R.

Bolinger, Jimmy W.; Pollman, Frederic W.; and Polaski, David N., to Sundstrand Corporation. Hydraulic transmission drive assembly with noise attenuation means. 4,111,003, Cl. 60-469.000.

Bolivia Lumber Company: *See*—
Garner, Lynn Thomas, 4,112,038, Cl. 264-138.000.

Bolliger, Alfred R. Assembly for testing shock absorbers incorporated in vehicles. 4,111,033, Cl. 73-11.000.

Bollman, James E., to Xerox Corporation. Field lens for an electrophotographic printing machine. 4,111,540, Cl. 355-4.000.

Bollman, James E.: *See*—
Mailloux, Louis D.; and Bollman, James E., 4,111,542, Cl. 355-14.000.

Bonassi, Luciano, to Costruzioni Barbarossa. Three-speed winch particularly for nautical use. 4,111,397, Cl. 254-150.00R.

Bone, Arnold R., to Dennison Manufacturing Company. Fastener attachment apparatus. 4,111,347, Cl. 227-68.000.

Bonisch, Frank Henry: *See*—
United States of America, National Aeronautics and Space Administration; and Bonisch, Frank Henry, 4,111,068, Cl. 74-586.000.

Bonitz, Eckhard: *See*—
Sander, Bruno; Bonitz, Eckhard; and Scherling, Kurt, 4,112,029, Cl. 264-11.000.

Bonner, Gary D.: *See*—
Jay, John; Bonner, Gary D.; and Betancourt, Osmundo J., 4,111,801, Cl. 210-40.000.

Booher, Robert K.: *See*—
Heimbigner, Gary L.; and Booher, Robert K., 4,112,296, Cl. 307-279.000.

Boomus, Mary; Sobin, Bernard; and Vincent, Monty E., to Gelman Instrument Company. Mouth filter for use with pipettes. 4,111,807, Cl. 210-152.000.

Borden Ost A/S: *See*—
Norgaard, Erik Bach, 4,111,333, Cl. 221-73.000.

Borg-Warner Corporation: *See*—
Fogelberg, Mark John, 4,111,288, Cl. 192-38.000.
Hechenbleikner, Ingenuin, 4,111,901, Cl. 260-45.80N.
Marien, Bruce Arthur; and Kaufman, Paul Richard, 4,112,022, Cl. 260-881.000.

Bormann, Dieter; Merkel, Wulf; and Mania, Dieter, to Hoechst Aktiengesellschaft. Derivatives of 5-aminobenzoic acid having a heterocyclic substituent in the 3-position. 4,111,953, Cl. 260-326.410.

Bormann, Gerhard; and Berthold, Richard, to Sandoz Ltd. Indolinylguanidines. 4,112,111, Cl. 424-274.000.

Borum, Charles Jerry, to Hobart Corporation. Multi-impression printer for pressure sensitive labels. 4,111,121, Cl. 101-227.000.

Bosy, George; Edwards, Edwin N.; Hoffbeck, Willis M.; Silvio, Paul A.; and Warwick, Leonard A., to Kraft, Inc. Method for manufacture of process cheese. 4,112,131, Cl. 426-582.000.

Bottomley, Alan Stuart. Electromagnetic apparatus. 4,111,027, Cl. 72-320.000.

Bouldin, David L.: *See*—
Hollis, Ben R., Jr.; Feltner, William R.; Bouldin, David L.; and Routh, Donald E., 4,111,775, Cl. 204-192.00C.

Bour, Edmond H. J. P., to Stamicarbon, B.V. Stabilization of polypyrolidone. 4,111,904, Cl. 260-45.75N.

Bourrie, Georges; and Lensel, Robert, to R. Alkan & Cie. Box opening device. 4,111,473, Cl. 292-126.000.

Boushey, Homer A. Variable flux transformer. 4,112,404, Cl. 336-133.000.

Bowley, Wallace W., to Hammond, Graeme L. Mass and heat transfer exchange apparatus. 4,111,659, Cl. 422-48.000.

Bowne Time Sharing, Inc.: *See*—
Abramson, Carl N.; Kohl, David; and Ogen, Thomas, 4,112,264, Cl. 179-175.30R.

Boyer, Peter W., to PHD, Inc. Non-rotatable fluid powered nozzle and valve combination. 4,111,100, Cl. 91-401.000.

Bozzelli, John W.; Shier, George D.; Pearce, Roscoe L.; and Martin, Charles W., to Dow Chemical Company, The. Absorption of sulfur compounds from gas streams. 4,112,049, Cl. 423-226.000.

BP Chemicals Limited: *See*—
Long, Dennis James George, 4,112,122, Cl. 426-19.000.

Bracht, Donald L.; and Swank, Harry R., to GTE Sylvania Incorporated. Floating tension tool and strap locating guide apparatus and method. 4,110,877, Cl. 29-25.130.

Bradley, Bruce R.; Eckelman, Larry D.; and Gilmer, Donald G., to Monsanto Company. Spun-like hand yarn process. 4,110,965, Cl. 57-157.0TS.

Bradner, William T.; Bush, James A.; and Nettleton, Donald E., Jr., to Bristol-Myers Company. Antibiotic complex. 4,112,071, Cl. 424-118.000.

Brady, John F.; and McDowell, Donald J., to Felt Products Mfg. Co. Roadway joint seal and sealing assembly. 4,111,583, Cl. 404-69.000.

Brandt, Richard Thornton, to General Electric Company. Gantry for computed tomography. 4,112,303, Cl. 250-445.00T.

Brass, Robert L., to General Mills Fun Group, Inc. Toy construction system having reusable distensible joining members. 4,110,932, Cl. 46-29.000.

Brauer, Dieter Bruno: *See*—
Everhart, Norman; and Brauer, Dieter Bruno, 4,112,386, Cl. 330-265.000.

Braukmann Armaturen AG: *See*—
Edelmann, Gunther, 4,111,392, Cl. 251-214.000.

Braun, Anton. Multistage gas compressor. 4,111,609, Cl. 417-243.000.

Braun, James R.: *See*—
Olson, Robert E.; and Braun, James R., 4,111,038, Cl. 73-65.000.

Braun, Leonard Charles; and Benno, Edward Leonard, to Illinois Tool Works Inc. Planting machine. 4,111,135, Cl. 111-2.000.

Breeding, Robert D., to Warner & Swasey Company, The. Material handling apparatus having means for connecting material handling tool with a boom. 4,111,320, Cl. 214-145.00A.

Bregman, David: *See*—
Wolvek, Sidney; Hanson, Bruce L.; and Bregman, David, 4,111,209, Cl. 128-400.000.

Brehm, William L., to B & G Equipment Company. Dispensing apparatus. 4,111,368, Cl. 239-394.000.

Breitschwerdt, Werner; Kania, Sigmund; Ukena, Theodor; and Schwammle, Otto, to Daimler-Benz Aktiengesellschaft. Hollow bearer of a passenger motor vehicle. 4,111,480, Cl. 296-28.00R.

Breuer, Hermann; and Treuner, Uwe, to E. R. Squibb & Sons, Inc. Cyanomethylthioacetylcephalosporin intermediates. 4,111,978, Cl. 260-465.00D.

Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, to Commissariat a l'Energie Atomique. Method of heat accumulation and a thermal accumulator for the application of said method. 4,111,260, Cl. 165-104.00S.

Briggs, Paul Clayton, Jr.; and Muschiatti, Lawrence Carl, to Du Pont de Nemours, E. I., and Company. Adhesive composition. 4,112,013, Cl. 260-878.00R.

Brisebarre, Marcel, to Systems and Technics S.A. Centrifugal coin sorter. 4,111,216, Cl. 133-3.00A.

Brishka, Alexander R.; and DeChamp, David W., to International Telephone and Telegraph Corporation. Polarizing keying device for electrical connectors. 4,111,514, Cl. 339-186.00R.

Bristol-Myers Company: *See*—
Berghahn, Walter G.; and Weinstein, Jack, 4,111,567, Cl. 401-202.000.
Bradner, William T.; Bush, James A.; and Nettleton, Donald E., Jr., 4,112,071, Cl. 424-118.000.
Crenshaw, Ronnie Ray; and Luke, George Michael, 4,112,234, Cl. 548-342.000.
Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., 4,112,230, Cl. 544-105.000.
Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 4,112,228, Cl. 544-26.000.

British Petroleum Company Limited, The: *See*—
Kolombos, Alexander John; McNeice, Donald; and Wood, Dennis Charles, 4,111,793, Cl. 208-121.000.
Kolombos, Alexander John, 4,112,011, Cl. 260-683.15R.

Broce, Richard D.: *See*—
Flanagan, Brian S.; Turner, Phillip L.; Broce, Richard D.; and Lagus, Peter L., 4,112,302, Cl. 250-381.000.

Brocklehurst, Jack, to Plastona (John Waddington) Ltd. Moulding of synthetic plastics sheet material. 4,112,042, Cl. 264-322.000.

Brohard, Ivan Eugene, to Bell Telephone Laboratories, Incorporated. Piezoelectric relay construction. 4,112,279, Cl. 200-181.000.

Brokmann, Manfred; Sanders, Kurt; Sanders, Dieter; and Westhoff, Hermann. Net for forming an elastic support in furniture. 4,112,163, Cl. 428-107.000.

Broser, Philip R. Rhythm instrument. 4,111,094, Cl. 84-402.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Gonnai, Tohru; and Yamashita, Chikao, 4,111,140, Cl. 112-254.000.

Brown, Albert E., to Columbia Ribbon & Carbon Manufacturing Co., Inc. Aqueous polyurethane undercoats. 4,112,178, Cl. 428-306.000.

Brown, Albert P.: *See*—
Hoddinott, David C.; and Brown, Albert P., 4,111,376, Cl. 242-25.00A.

Brown, Henry C. Wave-powered, pivoted float pumping system with increasing opposition to extreme movement of lever arm. 4,111,610, Cl. 417-332.000.

Brown, James L. Cassette tape cartridge holder. 4,111,308, Cl. 211-59.100.

Brown, Michael A.; and Shade, Steven F. Waterproof slide fastener. 4,112,150, Cl. 427-284.000.

Brown, Richard I.: *See*—
Boggs, Daniel R.; and Brown, Richard I., 4,111,356, Cl. 233-26.000.

Brown, Stanley L., to Roscoe Brown Corporation. Slack takeup apparatus for an endless excavating member. 4,110,920, Cl. 37-97.000.

Bruce, Peter. Link chain. 4,110,971, Cl. 59-84.000.

Brummett, Earl Ray, to Wallace Murray Corporation. Dimpled bimetal temperature responsive fan drive coupling. 4,111,289, Cl. 192-58.00B.

Bruner, Albert H., to Monsanto Company. Draw texturizing process. 4,110,964, Cl. 57-157.0TS.

Brunker, Dieter, to Anker-Schiffarts-Gesellschaft mbH & Co. KG. Valve bag. 4,111,354, Cl. 229-62.500.

Brunswick Corporation: *See*—
Fitzner, Arthur O.; and Sleder, Richard L., 4,111,174, Cl. 123-148.0CC.

Bryant, Lorton W., to Dresser Industries, Inc. Combined pressure and temperature correction apparatus for gas meters. 4,111,042, Cl. 73-194.00M.

Buchberger, Gregory D., to Morgan Industries. Controlled recovery automatic gain control amplifier. 4,112,384, Cl. 330-141.000.

Buchert, Hermann: *See*—
Postman, William; Louch, James B.; and Buchert, Hermann, 4,111,818, Cl. 252-8.900.

Buckholdt, Robert E., to Selas Corporation of America. Rotary hearth furnace with preheat conveyor. 4,111,644, Cl. 432-179.000.

Buckler, Ernest Jack; and Richmond, Michael Hugh, to Polysar Limited. Cups, plates, trays or containers formed from laminates containing filled polystyrene. 4,111,349, Cl. 229-3.50R.

Buckmaster, Adrian C.: *See*—
Glossop, Mark B.; Buckmaster, Adrian C.; Cook, Neville G. W.; Hojem, Justin P. M.; Joughin, Noel C.; Taylor, Richard F.; Cramp, Robert W.; and Hatcher, John L., 4,111,296, Cl. 198-519.000.

Buckwalter, Mervin R.; Bulson, Walter T.; Leininger, Larry W.; Posipanko, Thomas; and Ray, Leonard N., Jr., to Armstrong Cork Company. Method of no-contact printing of carpet with a transfer sheet. 4,111,646, Cl. 8-2.50A.

Budish, Joseph D. Temporary side view mirror for covering a vehicular mirror. 4,111,532, Cl. 350-307.000.

Bugaut, Andree: *See*—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,112,229, Cl. 544-105.000.

Bugay, Al, to Life Sciences, Inc. Direct readout real time physiological parameter analog computer. 4,112,491, Cl. 364-415.000.

Bugg, John: *See*—
Epstein, David; and Bugg, John, 4,111,253, Cl. 164-43.000.

Bula, Karl, to Sulzer Brothers Ltd. Net- or chain-like vehicle traction device for vehicular wheels. 4,111,251, Cl. 152-219.000.

Bulgrin, Robert W.: *See*—
Moffitt, Jerry T.; and Bulgrin, Robert W., 4,112,250, Cl. 338-322.000.

Bulidon, Jacques: *See*—
Pavan, Charles; and Bulidon, Jacques, 4,111,993, Cl. 260-586.00R.

Bullock, Robert L., to Standard Car Truck Company. Resilient railroad car truck. 4,111,131, Cl. 105-224.100.

Bulson, Walter T.: *See*—
Buckwalter, Mervin R.; Bulson, Walter T.; Leininger, Larry W.; Posipanko, Thomas; and Ray, Leonard N., Jr., 4,111,646, Cl. 8-2.50A.

Bundy, Gordon L., to Upjohn Company, The. Biheterocyclic-9,11-trideoxy-PGF compounds. 4,112,224, Cl. 542-426.000.

Bunker Ramo Corporation: *See*—
Golladay, James D.; and Abler, Norman C., 4,111,006, Cl. 66-9.00B.
Pracher, Ernst; Schrotter, Wolfgang Adalbert; and Heider, Wolfgang, 4,112,399, Cl. 335-106.000.

Burcenski, Michael J. Lawn game device with swung launching stick. 4,111,422, Cl. 273-101.000.

Burg, Karlheinz: *See*—
Sextro, Gunter; Burg, Karlheinz; Schlaf, Helmut; Sabel, Hans-Dieter; and Heller, Alwin, 4,111,912, Cl. 528-45.000.

Burgert, Albert, to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel. Miller-encoded message decoder. 4,112,383, Cl. 329-50.000.

Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., to Dow Chemical Company, The. 4-(2,2-Dichloro-1,1-difluoroethoxybenzene) sulfonyl chloride and its preparation. 4,111,988, Cl. 260-543.00R.

Burkart, Robert C.; and Newbould, Gilbert J., to Eash, Robert E., a part interest. Positive feed drill. 4,111,590, Cl. 408-14.000.

Burke, Edward F., Jr., to MFE Corporation. Method of making a limited-rotation motor with integral displacement transducer. 4,110,879, Cl. 29-25.420.

Burlington Industries, Inc.: *See*—
McConnell, Bobby Lee; Thornton, Raymond; and Graham, Louis Atkins, 4,111,648, Cl. 8-30.000.
Sorrells, Samuel Ray, 4,112,161, Cl. 428-95.000.

Burnett, Gary L.; and Tsuda, George I., to Hughes Aircraft Company. Temperature compensated microwave filter. 4,112,398, Cl. 333-73.00R.

Burnett, James E.: *See*—
Paranjpe, Suresh C.; and Burnett, James E., 4,112,469, Cl. 358-296.000.

Burnham, Robert D.: *See*—
Streifer, William; Scifres, Donald R.; and Burnham, Robert D., 4,111,521, Cl. 350-96.130.
Streifer, William; Scifres, Donald R.; and Burnham, Robert D., 4,112,389, Cl. 331-94.50H.

Burns, William M. Automobile ventilation system. 4,111,106, Cl. 98-2.130.

Burr-Brown Research Corporation: *See*—
Olschewski, Wilfred W.; and Stitt, Robert M., 4,112,308, Cl. 250-551.000.

Burroughs Corporation: *See*—
Chen, Chau-Shiong, 4,111,726, Cl. 148-175.000.
Pollard, Christopher A.; and Stiven, David, 4,112,471, Cl. 360-98.000.
Rege, Satish L.; and Woo, Beng-Yu, 4,112,504, Cl. 365-77.000.
Sniderman, Albert, 4,111,052, Cl. 73-432.00R.

Burton-Dixie Corporation: *See*—
Crown, Barry S., 4,111,241, Cl. 140-92.700.

Burwasser, Herman; and Wyhof, John R., to GAF Corporation. Dielectric imaging member. 4,112,172, Cl. 428-215.000.

Bush, James A.: *See*—
Bradner, William T.; Bush, James A.; and Nettleton, Donald E., Jr., 4,112,071, Cl. 424-118.000.

Butler, Donald Eugene, to Warner-Lambert Company. 3-(Thienyloxy)-pyridines and methods for their production. 4,111,943, Cl. 260-294.80D.

Butterworth, George A. M.; and Fillwalk, Frank, to Johnson & Johnson. Method of controlling water repellency in non-woven fabric. 4,112,153, Cl. 427-390.00E.

Buxbaum, Gunter; and Hund, Franz, to Bayer Aktiengesellschaft. Continuous production of iron oxide hydroxide. 4,112,063, Cl. 423-633.000.

Buynak, Gabriel Ralph; and Sauerland, Franz Ludwig, to Transat Corp. Vacuum deposition method for frequency adjustment of piezoelectric resonators. 4,112,134, Cl. 427-10.000.

Buzhinsky, Vladimir Lukyanovich; Raschepkin, Konstantin Egorovich; Dunjushkin, Mikhail Grigorievich; Lysogorsky, Gennady Tikhonovich; Valeev, Rustem Ibragimovich; Nisenbaum, Yakov Arkadievich; and Ikhsanov, Deviz Faizrakhmanovich. Machine for cleaning outer surface of pipes of a mainline. 4,110,862, Cl. 15-88.000.

C. R. Bard, Inc.: *See*—
Hessel, Stephen Roy, 4,111,204, Cl. 128-276.000.

C. van der Lely NV: *See*—
van der Lely, Ary, 4,111,265, Cl. 172-59.000.

Cabasso, Victor J., to Cutter Laboratories, Inc. Canine lung cell strain culture systems and processes for the cultivation of viruses and vaccines therefrom. 4,112,068, Cl. 424-89.000.

Cabiro, Jorge Canals: *See*—
Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,111,945, Cl. 260-297.00R.

Caesar, Philip D.; Garwood, William E.; Krudewig, William F.; and Wise, John J., to Mobil Oil Corporation. Combination process for upgrading synthol naphtha fractions. 4,111,792, Cl. 208-79.000.

Cahn, Robert P.; and Nicholson, Edward W., to Exxon Research & Engineering Co. Thermal energy storage by means of reversible heat pumping utilizing industrial waste heat. 4,110,987, Cl. 60-652.000.

Cairns, James E.: *See*—
Shair, Salem A.; Paul, Stewart N.; and Cairns, James E., 4,111,679, Cl. 71-67.000.

Calcaterra, Luigi: *See*—
Zurbuchen, Jacques; Leutenegger, Willi; and Calcaterra, Luigi, 4,111,645, Cl. 8-1.00W.

Callaghan, William I., to Towmotor Corporation. Control mechanism for hydrostatic transmissions. 4,111,062, Cl. 74-96.000.

Callahan, William A.; Glenn, Eldridge Myles; and Rector, Douglas L., to Upjohn Company, The. Methods of use of pyridylalkyl phenylthioureas. 4,112,100, Cl. 424-263.000.

Callan, John E., to Cities Service Company. Hot melt butyl sealant intermediate. 4,112,020, Cl. 260-873.000.

Cambiuzzi, Giulio; and Montanelli, Michele, to Baupres AG. Building block. 4,110,949, Cl. 52-437.000.

Cameron, Russell J., to Ross Operating Valve Co. Multiple function four poppet valve system. 4,111,226, Cl. 137-269.000.

Campbell, Alfred: *See*—
Wittle, Eugene Leroy; Rebstock, Mildred Catherine; Nicolaides, Ernest D.; and Campbell, Alfred, 4,111,923, Cl. 260-112.50R.

Campbell, James Stanley: *See*—
Baird, David Boyd; Campbell, James Stanley; Fishwick, Brian Ribbons; and McClelland, Robert David, 4,111,956, Cl. 260-329.0AM.

Canada-Cities Service, Ltd.: *See*—
Porteous, Kenneth; Falkenberg, Leigh; and Lane, Stephen, 4,111,789, Cl. 208-11.0LE.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Victor, William E., 4,111,217, Cl. 135-15.0PQ.

Canadian General Electric Company: *See*—
Lonseth, Palmer; Panter, Hubert Gerald; and Moorby, Donald G., 4,110,900, Cl. 29-596.000.
Lonseth, Palmer; Panter, Hubert Gerald; and Moorby, Donald G., 4,112,041, Cl. 264-263.000.

Canadian Patents and Development Limited: *See*—
Meadus, Frederick W.; Sparks, Bryan D.; and Puddington, Ira E., 4,111,874, Cl. 260-23.00R.
Woodhams, Raymond T.; and Xanthos, Marinos, 4,112,036, Cl. 264-28.000.

Cancilla, Vincent W., to Beloit Corporation. Stock screen foil. 4,111,799, Cl. 209-273.000.

Candor, James T. Electrostatic method and apparatus for treating material. 4,111,773, Cl. 204-180.00R.

Canevari, Roger: *See*—
Regnier, Gilbert; Canevari, Roger; and Poignant, Jean-Claude, 4,112,092, Cl. 424-250.000.

Canney, John J. Combustion air system. 4,111,181, Cl. 126-77.000.

Canon Kabushiki Kaisha: *See*—
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,111,539, Cl. 355-3.00R.
Ikemori, Keiji, 4,111,558, Cl. 350-189.000.

Canplan Filtration Limited: *See*—
Jay, John; Bonner, Gary D.; and Betancourt, Osmundo J., 4,111,801, Cl. 210-40.000.

Canron Railgroup: *See*—
Keyes, John, 4,111,128, Cl. 104-7.00B.
von Beckmann, Helmuth, 4,111,129, Cl. 104-12.000.

Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, to United States Steel Corporation. Method of assembling continuous casting discharge rack. 4,110,889, Cl. 29-407.000.

Carborundum Company, The: *See*—
Bodolai, John J., 4,110,939, Cl. 51-298.00R.
Walker, Thomas Bruce; Seider, Robert J.; and Cichy, Paul, 4,111,668, Cl. 51-309.00A.

Carel, Philippe Robert Raymond; Decamp, Rene Paul Auguste; and Perronin, Jean, to Produits Chimiques Ugine Kuhlmann. Process for sizing substrate and products obtained thereby. 4,112,155, Cl. 427-439.000.

Carl Freudenberg, Firma: *See—*
Schuhmacher, Gunter; and Muhlfeld, Horst, 4,111,913, Cl. 528-273.000.
Sick, Hans-Hermann; and Habel, Erich, 4,111,441, Cl. 277-183.000.

Carlson, Charles E. K.: *See—*
Rothman, Edward A.; and Carlson, Charles E. K., 4,111,600, Cl. 416-2.000.

Carlson, Elmer T. Bus tray electrical distribution system. 4,112,249, Cl. 174-68.00B.

Carlson, Gaynor. Animal guard. 4,110,943, Cl. 52-101.000.

Carlson, Gaynor. Animal protective guard. 4,110,944, Cl. 52-101.000.

Carlson, John Alan; and Bell, Malcolm Rice, to Sterling Drug Inc. Anti-inflammatory 3-(substituted-amino)-2,1-benzisothiazoles. 4,112,105, Cl. 424-270.000.

Carlson, Karl Gunnar: *See—*
Olsson, Jan Christer Holger; and Carlson, Karl Gunnar, 4,110,954, Cl. 53-433.000.

Carlson, William G.: *See—*
Hower, Philip L.; Carlson, William G.; and Gupta, Tapan K., 4,112,362, Cl. 324-158.00R.

Carlsson, Hans Ake Ulf. Automatic coupling unit for braking and electrical functions between parts in a vehicle combination. 4,111,452, Cl. 280-421.000.

Carlsson, Jan-Erik: *See—*
Dahlman, Goran; and Carlsson, Jan-Erik, 4,111,024, Cl. 72-60.000.

Carlsson, Stig. Loudspeaker and stereophonic loudspeaker system. 4,112,256, Cl. 179-1.0GA.

Carlstedt, Richard A., to Aetna Bearing Company. Thrust bearing with spring clip mounting. 4,111,290, Cl. 192-98.000.

Carmosin, Richard J.: *See—*
Carson, John Robert; Carmosin, Richard J.; and Stefanski, Anthony T., 4,111,954, Cl. 260-326.620.

Carnation Company: *See—*
Nielsen, Ramon W.; and Widmar, Craig C., 4,112,126, Cl. 426-250.000.

Carp, Ralph W.; Ang, Leoncio T.; and Rini, Guy T., to Bendix Corporation, The. Pressure command generator with initial condition logic for adaptive braking system. 4,111,497, Cl. 303-110.000.

Carpenter, C. Thomas; and Stunkard, Norman W., to Voltage Systems, Inc. Alignment plate construction for electrostatic particle orientation. 4,111,294, Cl. 198-381.000.

Carpenter Technology Corporation: *See—*
Mead, Kenneth W.; and Peters, K. Stewart, 4,112,289, Cl. 219-124.330.

Carr, Ronald R., to Panel Clip Co., The. Machine for applying nail plates for truss assembly. 4,111,114, Cl. 100-100.000.

Carrico, Philip H.: *See—*
Nash, James L.; Polich, Stanley J.; and Carrico, Philip H., 4,112,034, Cl. 264-95.000.

Carrillo, Rolando, Jr. Wiped cutter. 4,111,593, Cl. 408-204.000.

Carroll, William J.; and Griffith, George L., to IMC Chemical Group, Inc. Nitrate esters of galactomannan gums and metnods for their synthesis. 4,112,220, Cl. 536-18.000.

Carrozo, Camelita R., to Colgate-Palmolive Company. Needlepoint, embroidery and crewel carrying case. 4,111,341, Cl. 223-106.000.

Carson, John Robert; Carmosin, Richard J.; and Stefanski, Anthony T., to McNeil Laboratories, Incorporated. Preparation of 1-methylpyrrole-2-acetonitrile. 4,111,954, Cl. 260-326.620.

Carter, Donna B., sole heir: *See—*
Carter, Thomas A., Jr., deceased, 4,111,362, Cl. 239-1.000.

Carter, L. Dean: *See—*
Rocha, James; and Carter, L. Dean, 4,111,076, Cl. 81-9.50A.

Carter, Thomas A., Jr., deceased (by Carter, Donna B., sole heir), to Airco, Inc. System for making carbon dioxide snow. 4,111,362, Cl. 239-1.000.

Carter, Walter L. Tool holder. 4,111,083, Cl. 82-36.00A.

Cartes, Juan Bosch: *See—*
Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,111,945, Cl. 260-297.00R.

Caruso, Gerard P., to Shell Oil Company. Grease compositions. 4,111,822, Cl. 252-51.50A.

Casey, Donald James: *See—*
Huffman, Kenneth Robert; Casey, Donald James; and Thomas, Walter Moreland, 4,112,169, Cl. 428-206.000.

Casey, Gary L., to General Motors Corporation. Ignition system for use with fuel injected-spark ignited internal combustion engines. 4,111,178, Cl. 123-32.0SA.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,110,966, Cl. 58-4.00A.

Casse, Christian Robert: *See—*
Pompei, Michel; and Casse, Christian Robert, 4,111,478, Cl. 293-63.000.

Casselbrant, Sven Gustav, to Svenska Utvecklingaktiebolatget. Structural chipboard wood beam. 4,112,162, Cl. 428-106.000.

Caterpillar Tractor Co.: *See—*
Alstrin, Charles E.; McClung, Carl L.; and Smith, James C., 4,111,166, Cl. 123-97.00B.
Chelgren, Walter C., 4,111,370, Cl. 239-533.300.
Daniels, Jerry Lee; and Woody, Albert Lloyd, 4,111,287, Cl. 192-3.270.
Hickman, Donald A.; and Kershaw, Samuel L., 4,111,455, Cl. 280-690.000.
Pearce, Shairyl I.; and Audiffred, Sidney J., 4,111,071, Cl. 74-753.000.
Poker, John M., Jr., 4,110,921, Cl. 37-141.00R.
Purcell, Robert J., 4,111,064, Cl. 74-243.0DR.

Cates, Robert E., to Marley Company, The. Method for indirect evaporative cooling of upflowing fluid by contact with downflowing water from overlying evaporative cooling section. 4,112,027, Cl. 261-151.000.

Cathers, William P., to PPG Industries, Inc. Conveyor for separating and aligning glass sheets. 4,111,412, Cl. 271-251.000.

Cathers, William P.: *See—*
Donley, Harold E.; and Cathers, William P., 4,111,150, Cl. 118-7.000.

Caunt, Anthony David; and Williams, Ian Gabriel, to Imperial Chemical Industries Limited. Process for preparing a transition metal compound and it's use as a component in an olefin polymerization catalyst. 4,111,834, Cl. 252-429.00B.

Cawse, James Norman; and Vidal, Jose Luis, to Union Carbide Corporation. Catalytic process for producing polyhydric alcohols and derivatives. 4,111,975, Cl. 260-449.00L.

Cazel, Gerald C.: *See—*
Cazel, Thomas R.; and Cazel, Gerald C., 4,111,549, Cl. 355-68.000.

Cazel, Thomas R.; and Cazel, Gerald C. Platemaker and contact frame exposure indicator. 4,111,549, Cl. 355-68.000.

Celanese Corporation: *See—*
Choe, Eui Won, 4,112,212, Cl. 526-234.000.
DiEdwardo, Andrew H.; and Dix, Robert, 4,112,059, Cl. 423-447.600.
Lazear, Nelson R., 4,112,146, Cl. 427-54.000.
Lin, Victor J., 4,111,620, Cl. 425-66.000.
Shaner, Jay R.; and Edelman, Robert, 4,111,887, Cl. 260-37.0AL.
Taylor, Paul D., 4,111,837, Cl. 252-430.000.
Thomas, Norman W.; Model, Frank S.; and Smart, Charles L., 4,111,684, Cl. 71-115.000.

Celanese Polymer Specialties Company: *See—*
Simons, James Brandon, 4,111,909, Cl. 528-123.000.

Ceskoslovenska akademie ved: *See—*
Puffr, Rudolf; and Sebenda, Jan, 4,111,869, Cl. 260-18.00N.
Strop, Petr; Coupek, Jiri; and Mikes, Otakar, 4,111,859, Cl. 521-33.000.

Cgee Alsthom: *See—*
Debaigt, Jean, 4,111,517, Cl. 339-198.0GA.

Champion International Corporation: *See—*
Roccaforte, Harry I., 4,111,306, Cl. 206-611.000.
Roudebush, Allen T.; and Thompson, Kenneth P., 4,112,173, Cl. 428-215.000.

Chan, David Cheong King, to Chevron Research Company. Fungicidal, miticidal and ovicidal alkoxycarbonylalkyl-substituted and carbamylalkyl-substituted N-haloalkylthiosulfonamides. 4,112,237, Cl. 560-12.000.

Chana, Howard E., to General Motors Corporation. Progressively variable transmission. 4,111,073, Cl. 74-865.000.

Chapman, Douglas W.; and Bertsch, Hugh C., to Mallinckrodt, Inc. Method for the preparation of pure 2-ethylhexyl gallate. 4,112,238, Cl. 560-70.000.

Charkoudian, John C.; and Hoffman, Arnold, to Polaroid Corporation. Battery electrolyte corrosion inhibitor. 4,112,205, Cl. 429-199.000.

Charles, John J.: *See—*
Gasman, Robert C.; and Charles, John J., 4,111,893, Cl. 260-40.00R.

Charles Stark Draper Laboratory, Inc., The: *See—*
Smith, Thomas Basil, III, 4,112,488, Cl. 364-200.000.

Chasen, Lee Richard: *See—*
Einhorn, Ruediger; Chasen, Lee Richard; and Blake, Joseph Walter, III, 4,110,907, Cl. 30-164.950.

Chelgren, Walter C., to Caterpillar Tractor Co. Fuel inlet fitting for a fuel injection nozzle. 4,111,370, Cl. 239-533.300.

Chellis, Marge. Rain chapes. 4,110,845, Cl. 36-2.00R.

Chemed Corporation: *See—*
Shair, Salem A.; Paul, Stewart N.; and Cairns, James E., 4,111,679, Cl. 71-67.000.

Chemetron Corporation: *See—*
Williamson, Hilding Victor, 4,111,671, Cl. 62-10.000.

Chemineer, Inc.: *See—*
Barbini, Richard J., 4,111,402, Cl. 366-338.000.

Chen, Chau-Shiong, to Burroughs Corporation. Bipolar integrated circuit process by separately forming active and inactive base regions. 4,111,726, Cl. 148-175.000.

Chen, Edward S.; Sadak, John C.; and Lakshminarayanan, G. Raman, to United States of America, Army. Method and electrolyte for the electrodeposition of cobalt and cobalt-base alloys in the presence of an insoluble anode. 4,111,760, Cl. 204-26.000.

Chen, Nai Yuen; Miale, Joseph Nicolas; and Reagan, William Joseph, to Mobil Oil Corporation. Preparation of zeolites. 4,112,056, Cl. 423-329.000.

Chen, Robert H. K., to Ortho Pharmaceutical Corporation. Isolation of uteroevacuant substances from plant extracts. 4,112,078, Cl. 424-195.000.

Chen, Robert H. K., to Ortho Pharmaceutical Corporation. Isolation of uteroevacuant substances from plant extracts. 4,112,079, Cl. 424-195.000.

Cheng, Robin; and Cross, Kenneth MacLean, to 3C Chemical Laboratories Pty. Limited. Wall mounted actuator for aerosol can. 4,111,338, Cl. 222-180.000.

Chenot, Charles Frederic; Mathers, James Evan; and Shaffer, Francis

Nathan, to GTE Sylvania Incorporated. Hexagonal hafnium, zirconium phosphate luminescent material, method of preparation, and x-ray intensifying screen containing the same. 4,112,194, Cl. 428-539.000.

Cherry Electrical Products Corp.: *See*—
Greiner, Gunter; and Murmann, Gunter, 4,112,278, Cl. 200-156.000.

Chervenak, Michael C.; and Johanson, Edwin S., to Hydrocarbon Research, Inc. Staged hydrogenation of low rank coal. 4,111,788, Cl. 208-10.000.

Chesnut, Jon C.; and Epstein, Edward, to Beatrice Foods Co. Semi-moist shelf stable particle for carrying a food color and flavor. 4,112,125, Cl. 426-250.000.

Chevron Research Company: *See*—
Chan, David Cheong King, 4,112,237, Cl. 560-12.000.
Iscol, Lewis; and Cochran, Lynn E., 4,112,414, Cl. 340-146.10E.
Singer, Malcolm Scott, 4,111,683, Cl. 71-104.000.
Woo, Gar Lok, 4,111,864, Cl. 521-117.000.

Chicago Lock Co.: *See*—
Scherbing, Frank J., 4,111,020, Cl. 70-363.000.

Chloride, Incorporated: *See*—
Malinowski, William J., 4,112,310, Cl. 250-574.000.

Cho, Alfred Yi; DiLorenzo, James Vincent; and Mahoney, Gerard Edward, to Bell Telephone Laboratories, Incorporated. Selective lift-off technique for fabricating GaAs FETs. 4,111,725, Cl. 148-175.000.

Choe, Eui Won, to Celanese Corporation. Ultra-high molecular weight polymethacryloyloxybenzoic acid and method of preparation. 4,112,212, Cl. 526-234.000.

Christensen, La Mon D.: *See*—
Schreiber, Ronald E.; and Christensen, La Mon D., 4,111,424, Cl. 273-106.50C.

Christian, Timothy T. Controlling the fluid in a ball valve. 4,111,229, Cl. 137-614.170.

Christman, Peter C.: *See*—
Haeflich, Jack; and Christman, Peter C., 4,110,973, Cl. 60-39.050.

Chung, Asuncion, to H. K. Porter Company, Inc. Double side air break disconnecting switch. 4,112,268, Cl. 200-48.0SB.

Chyu, Hyun S., to Monsanto Company. Method of extruding thermoplastic sheets. 4,112,166, Cl. 428-141.000.

Ciarimboli, Joseph P., to Pennsylvania Coke Technology, Inc. Smokeless and non-recovery type coke oven battery. 4,111,757, Cl. 202-93.000.

Ciba Geigy AG: *See*—
Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, 4,111,888, Cl. 260-31.600.
Ward, Frank, deceased; Hildreth, John David; and Potts, Herbert Alexander, 4,111,649, Cl. 8-41.00R.
Zurbuchen, Jacques; Leutenegger, Willi; and Calcaterra, Luigi, 4,111,645, Cl. 8-1.00W.

Ciba-Geigy Corporation: *See*—
Balke, David E.; and Perez, Donald E., 4,111,976, Cl. 260-453.0RW.
Baschang, Gerhard; Sele, Alex; Stanek, Jaroslav; and Rossi, Alberto, 4,112,075, Cl. 424-180.000.
Blattner, Hans, 4,112,110, Cl. 424-274.000.
Darms, Roland; Kvita, Vratislav; and Greber, Gerd, 4,111,771, Cl. 204-159.220.
Gagneux, Andre; Heckendorn, Roland; and Meier, Rene, 4,111,950, Cl. 260-308.00R.
Green, George Edward; Stark, Bernard Peter; and Waterhouse, John Sidney, 4,111,907, Cl. 260-830.00R.
Haas, Georges; and Rossi, Alberto, 4,112,099, Cl. 424-263.000.
Hindermann, Peter; Adam, Jean-Marie; and Karlen, Urs, 4,111,966, Cl. 260-373.000.
Jager, Horst, 4,111,817, Cl. 252-8.800.
Lacroix, Roger; and Haberli, Roland, 4,111,650, Cl. 8-85.00R.
L'Eplattenier, Francois; Pugin, Andre; and von der Crone, Jost, 4,111,947, Cl. 260-299.000.
Mazour, Zdenek; and Dayer, Francis Louis, 4,111,974, Cl. 260-448.80R.
Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,111,804, Cl. 210-58.000.
Polony, Rudolf; Rauchle, Adolf; and Heizler, Fritz, 4,111,844, Cl. 252-106.000.

Cichy, Paul: *See*—
Walker, Thomas Bruce; Seider, Robert J.; and Cichy, Paul, 4,111,668, Cl. 51-309.00A.

Cincinnati Electronics Corp.: *See*—
Seward, Glen, 4,112,395, Cl. 333-17.00M.

Cirkler, Werner; and Krueger, Hans, to Siemens Aktiengesellschaft. Optical display device. 4,111,534, Cl. 350-345.000.

Cisterni, Leandro, to S.U.B. Societa Utilizzazione Brevetti S.r.l. Method of manufacturing a lining layer. 4,112,145, Cl. 427-274.000.

Cities Service Company: *See*—
Callan, John E., 4,112,020, Cl. 260-873.000.
Dizon, Edwin S., 4,111,189, Cl. 126-400.000.

Citizen Watch Company Limited: *See*—
Funazawa, Masakazu; and Matsumura, Osamu, 4,110,970, Cl. 58-90.00R.

Cizek, Jaroslav: *See*—
Bezstarosti, Ladislav; Lindental, Antonin; Lanta, Jiri; and Cizek, Jaroslav, 4,111,238, Cl. 139-436.000.

Clark Equipment Company: *See*—
Hastings, Russell, Jr., 4,111,283, Cl. 187-9.00R.

Clarke, Graham John, to Marconi Instruments Limited. Control devices. 4,112,340, Cl. 318-331.000.

Clarkson, Stanley G.: *See*—
Tates, Donald W.; and Clarkson, Stanley G., 4,111,410, Cl. 271-173.000.

Clavaud, Bernard Alain: *See*—
Kiehl, Jean-Pierre; Jost, Victor; and Clavaud, Bernard Alain, 4,111,711, Cl. 106-97.000.

Clay, Robert B. Water-in-oil blasting composition. 4,111,727, Cl. 149-2.000.

Clements, Joseph A., Jr., to Clements, Joseph A., Sr. Ski pole with timing device. 4,111,444, Cl. 280-11.37E.

Clements, Joseph A., Sr.: *See*—
Clements, Joseph A., Jr., 4,111,444, Cl. 280-11.37E.

Cluett, Peabody & Co. Inc.: *See*—
Rockerath, John L.; and Schreck, Harold J., 4,111,138, Cl. 112-141.000.

Clunie, James Spence: *See*—
Dake, Timothy William; Clunie, James Spence; and Early, Allen Dale, 4,112,167, Cl. 428-154.000.

Coal Industry (Patents) Limited: *See*—
Mullins, Rex, 4,111,487, Cl. 299-1.000.
Price, David Watkin; Hodges, Newton John; and Furley, Robert, 4,111,709, Cl. 106-67.000.

Coale, Cecil R., Jr.: *See*—
Allen, John B.; and Coale, Cecil R., Jr., 4,111,383, Cl. 244-3.130.

Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, to Smith Kline & French Laboratories Limited. 3-Chloro-6-phenylpyridazine compounds. 4,111,935, Cl. 544-224.000.

Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, to Smith Kline & French Laboratories Limited. Pyridazinethiones. 4,111,936, Cl. 544-239.000.

Coats & Clark, Inc.: *See*—
Einhorn, Ruediger; Chasen, Lee Richard; and Blake, Joseph Walter, III, 4,110,907, Cl. 30-164.950.
Schleifstein, Robert, 4,111,647, Cl. 8-4.000.

Cobb, Carolus M.: *See*—
Annis, Martin; Bjorkholm, Paul; Cobb, Carolus M.; Frederick, Edwin; and Ramsey, Alan, 4,112,301, Cl. 250-364.000.

Coca-Cola Company, The: *See*—
Gupta, Ashis S., 4,112,130, Cl. 426-471.000.

Cochran, Lynn E.: *See*—
Iscol, Lewis; and Cochran, Lynn E., 4,112,414, Cl. 340-146.10E.

Coghlan, Charles C. Therapy of leg muscle cramps. 4,112,115, Cl. 424-300.000.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Silicon ester of carboxylic acid. 4,111,961, Cl. 260-345.80R.

Cohen, Sasson: *See*—
Ashani, Yacov; Amitai, Gavriel; Grunfeld, Yona; Kalir, Asher; and Cohen, Sasson, 4,112,082, Cl. 424-209.000.

Cojan, Yves, to Thomson-CSF. Display instrument using optical collimation. 4,111,527, Cl. 350-174.000.

Colgate-Palmolive Company: *See*—
Carrozo, Camelita R., 4,111,341, Cl. 223-106.000.
Giombini, Giuseppe, 4,112,517, Cl. 366-102.000.

Colilla, William; and Lloyd, Norman E., to Standard Brands Incorporated. Process for converting liquefied starch to a mixture of glucose and fructose utilizing a multi-component immobilized enzyme system. 4,111,750, Cl. 195-31.00F.

Colin, Jean-Michel; and Herouard, Dominique, to Compagnie Francaise de Raffinage. Process for the specific quantitative detection of sulfur compounds and apparatus for carrying out this process. 4,111,554, Cl. 356-36.000.

Collins, Steven; and Fausett, A. Wayne, to Alton Box Board Company. Partitioned tray and multiple tray container. 4,111,353, Cl. 229-34.00R.

Collo GmbH: *See*—
Kalbow, Heinz, 4,111,666, Cl. 51-295.000.

Colman, Gregory D.: *See*—
Jandl, Frank W.; and Colman, Gregory D., 4,110,977, Cl. 60-270.00R.

Columbia Ribbon & Carbon Manufacturing Co., Inc.: *See*—
Brown, Albert E., 4,112,178, Cl. 428-306.000.

Combey, Malcolm: *See*—
Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, 4,111,888, Cl. 260-31.600.

Combs, James M.: *See*—
Lytle, John David; and Combs, James M., 4,110,912, Cl. 33-312.000.

Commercial Shearing, Inc.: *See*—
Mauch, David L., 4,111,103, Cl. 92-57.000.

Commissariat a l'Energie Atomique: *See*—
Artaud, Robert, 4,112,055, Cl. 423-261.000.
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,111,260, Cl. 165-104.00S.

Commonwealth Scientific and Industrial Research Organization: *See*—
Plate, Dieter Erich Alexander; and Feehan, John Desmond, 4,110,963, Cl. 57-86.000.
Wild, John Paul, 4,112,431, Cl. 343-768.000.

Communications Satellite Corporation: *See*—
Dunlop, James D.; and Stockel, Joseph, 4,112,199, Cl. 429-29.000.

Compagnie Francaise de Raffinage: *See*—
Colin, Jean-Michel; and Herouard, Dominique, 4,111,554, Cl. 356-36.000.
Weisang, Joseph-Edouard; and Engelhard, Philippe, 4,111,841, Cl. 252-439.000.

Compagnie Generale d'Electricite S.A.: *See—*
Farcy, Jean-Claude, 4,112,390, Cl. 331-94.50G.
Godard, Bruno, 4,112,391, Cl. 331-94.5PE.
Jacquelin, Jean, 4,112,409, Cl. 338-222.000.

Compagnie Generale des Etablissements Michelin: *See—*
deZarauz, Yves, 4,112,210, Cl. 526-187.000.

Compagnie Internationale pour l'Informatique Cii-Honeywell Bull: *See—*
Duval, Jean-Claude; Mottini, Francis Joseph; Touron, Serge Auguste; Rennard, Jean-Jacques Francois; and Duval, Ruchela Marie, 4,112,505, Cl. 365-96.000.

Compton, Peter Arnold, to Mars Limited. Plastics containers. 4,111,303, Cl. 206-520.000.

Cone, Donald Roy, to Mead Corporation, The. Glass nozzle array for an ink jet printer and method of forming same. 4,112,436, Cl. 346-140.00R.

Conley, Earl, to Kane, Cyril Cecil, a part interest. Carburetor by-pass. 4,111,167, Cl. 123-102.000.

Connick, William J., Jr.; and Ellzey, Samuel E., Jr., to United States of America, Agriculture. Polyfluorinated amine oil-repellent, stain-release fabric treatment. 4,111,700, Cl. 106-2.000.

Consolidated Natural Gas Service Company, Inc.: *See—*
Syska, Andrew J., 4,111,687, Cl. 75-13.000.

Consumers Digital Systems Corp.: *See—*
Fetterman, Charles P., 4,111,243, Cl. 141-102.000.

Conti, Allen C. Coating and methods for pulling cable and drawing wire. 4,111,820, Cl. 252-49.500.

Continental Group, Inc., The: *See—*
Jordan, Thomas F., 4,111,330, Cl. 220-306.000.
Mascia, Carmen T.; and Hasegawa, Gary K., 4,111,298, Cl. 206-151.000.
Pan, Peter N. Y.; and Wronski, Steve F., 4,112,285, Cl. 219-10.410.

Continental Oil Company: *See—*
Wingrave, James A., 4,112,206, Cl. 526-3.000.

Controls, Inc.: *See—*
Fosnough, Robert D.; and Nelson, Max A., 4,112,376, Cl. 325-455.000.

Conway, Terry T.: *See—*
Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., 4,112,230, Cl. 544-105.000.

Conwed Corporation: *See—*
Banister, Peter George, 4,110,857, Cl. 5-337.000.
Van Natta, Cletus L., 4,111,673, Cl. 65-6.000.

Cook, George E.: *See—*
Sullivan, Neal; and Cook, George E., 4,111,443, Cl. 219-497.000.

Cook, Neville G. W.: *See—*
Glossop, Mark B.; Buckmaster, Adrian C.; Cook, Neville G. W.; Hojem, Justin P. M.; Joughin, Noel C.; Taylor, Richard F.; Cramp, Robert W.; and Hatcher, John L., 4,111,296, Cl. 198-519.000.

Cooke, Theodore M., to Monarch Marking Systems, Inc. Impregnating porous articles. 4,112,151, Cl. 427-322.000.

Cooksey, James Judson: *See—*
Weiss, William Robert; Cooksey, James Judson; and Gordon, Rob Roy, Jr., 4,110,876, Cl. 28-271.000.

Cooley, Jack Seabron: *See—*
Culpepper, Will Lester; and Cooley, Jack Seabron, 4,111,105, Cl. 93-37.0SP.

Cooper, Erwin E., to Texas Instruments Incorporated. Scanner system for laser beam rider guidance systems. 4,111,384, Cl. 244-3.130.

Cooper, Hugh Melvin: *See—*
Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, 4,111,888, Cl. 260-31.600.

Coors Porcelain Company: *See—*
Ford, Wilson; and Gagnon, John Temple, 4,111,026, Cl. 72-289.000.

Copar Corporation: *See—*
Schmidt, Stephen R., 4,112,379, Cl. 328-5.000.

Copeland Corporation: *See—*
Bergman, Ernest R., 4,111,278, Cl. 181-249.000.

Cordes, William Frederick, III, to American Cyanamid Company. Heat stabilized halogen-containing polymers. 4,111,873, Cl. 260-23.0XA.

Cordonnier, Raymond: *See—*
Truffier, Jean-Claude; Lucotte, Gerard; and Cordonnier, Raymond, 4,112,074, Cl. 424-177.000.

Cornelius Company, The: *See—*
Hassell, David Allen, 4,111,222, Cl. 137-69.000.

Cornell-Dubilier Electric Corp.: *See—*
Douglas, Philip N., 4,112,343, Cl. 318-674.000.

Corning Glass Works: *See—*
Blaszyk, Paul E.; Shoup, Robert D.; and Wein, William J., 4,112,032, Cl. 264-42.000.
Flannery, James E.; and Wexell, Dale R., 4,111,708, Cl. 106-53.000.
Rauscher, Herbert E., 4,112,170, Cl. 428-212.000.
Weetall, Howard H., 4,111,752, Cl. 195-103.50M.

Coronet-Werke Heinrich Schlerf GmbH: *See—*
Weihrauch, Georg, 4,110,870, Cl. 16-114.00R.

Corpus, Enrique: *See—*
Wendler, Gunter K.; Corpus, Enrique; and Ohannesian, Michael J., 4,110,886, Cl. 29-255.000.

Cory, Charles E., to Bepex Corporation. Continuous filter press. 4,111,115, Cl. 100-116.000.

Costruzioni Barbarossa: *See—*
Bonassi, Luciano, 4,111,397, Cl. 254-150.00R.

Coulton, Derek A.: *See—*
Selig, Thomas R.; Yasar, Tugrul; and Coulton, Derek A., 4,112,196, Cl. 428-594.000.

Coupek, Jiri: *See—*
Strop, Petr; Coupek, Jiri; and Mikes, Otakar, 4,111,859, Cl. 521-33.000.

Courtaulds Limited: *See—*
Robinson, Frank; and Whatmough, Nigel Stephen, 4,111,008, Cl. 66-176.000.
Robinson, Frank; Girt, Keith Harry; and Whatmough, Nigel Stephen, 4,111,009, Cl. 66-189.000.

Cox, Rollin Webb; and Watson, Randy Charles. Posterior knee immobilizing brace. 4,111,194, Cl. 128-80.00C.

Cragoe, Edward J., Jr.: *See—*
Bicking, John B.; and Cragoe, Edward J., Jr., 4,112,236, Cl. 560-12.000.

Crail, Timothy A.: *See—*
Wong, Mon N.; and Crail, Timothy A., 4,112,432, Cl. 343-786.000.

Cramp, Robert W.: *See—*
Glossop, Mark B.; Buckmaster, Adrian C.; Cook, Neville G. W.; Hojem, Justin P. M.; Joughin, Noel C.; Taylor, Richard F.; Cramp, Robert W.; and Hatcher, John L., 4,111,296, Cl. 198-519.000.

Cranston, Dale O., to Litton Industrial Products, Inc. Ultrasonic dental scaler. 4,110,908, Cl. 32-50.000.

Crawford, Douglas W.: *See—*
Elliott, J. Kelly; and Crawford, Douglas W., 4,111,608, Cl. 417-112.000.

Crawford, Thomas C., to Pfizer Inc. Ascorbic acid synthesis. 4,111,958, Cl. 260-340.700.

Creekmore, Mark D.; and Watts, William A., to Goodyear Tire & Rubber Company, The. Packaging films and packaged articles therewith. 4,112,158, Cl. 428-35.000.

Crenshaw, Ronnie Ray; and Luke, George Michael, to Bristol-Myers Company. Imidazolylmethylthioethyl alkynyl guanidines. 4,112,234, Cl. 548-342.000.

Crepeau, Robert G.; and Karakis, Thomas G., to Allen-Bradley Company. Rotatable cam limit switch with variable timing and dwell. 4,112,265, Cl. 200-31.00R.

Creusot-Loire: *See—*
Dulaquais, Pierre, 4,111,029, Cl. 72-342.000.

Cricket Corporation: *See—*
Maness, John F., 4,110,931, Cl. 43-55.000.

Cromer, Charles F.; Yoon, Kue H.; and Freeman, Willie B., to Westinghouse Electric Corp. Compressed-gas circuit-interrupter having a sleeve-valve for temporarily blocking the orifice throat. 4,112,276, Cl. 200-148.00R.

Crompton & Knowles Corporation: *See—*
Hoddinott, David C.; and Brown, Albert P., 4,111,376, Cl. 242-25.00A.

Cross, Kenneth MacLean: *See—*
Cheng, Robin; and Cross, Kenneth MacLean, 4,111,338, Cl. 222-180.000.

Crounse, Nathan N.; and Desai, Kantilal B., to Sterling Drug Inc. Certain substituted 2-phenylnaphtho[1,2-b]furane and -[2,1-b]furane. 4,111,962, Cl. 260-346.710.

Crown, Barry S., to Burton-Dixie Corporation. Spring forming means in automatic coil spring assembling machine. 4,111,241, Cl. 140-92.700.

Cuff, David W., to Leesona Corporation. Pelletizing process. 4,112,039, Cl. 264-142.000.

Culpepper, Will Lester; and Cooley, Jack Seabron, to Mead Corporation, The. Machine and method for placing an insert into an article carrier cell. 4,111,105, Cl. 93-37.0SP.

Cummings, Henry S.; and Leone, Richard P., to Lowell Corporation. Ratchet wrench. 4,111,077, Cl. 81-63.000.

Cunningham, Robert W.: *See—*
Kurtz, Abraham N.; Cunningham, Robert W.; and Naumann, Alfred W., 4,111,983, Cl. 562-535.000.

Cushman, David W.: *See—*
Ondetti, Miguel Angel; and Cushman, David W., 4,112,119, Cl. 424-317.000.

Cussons, Frank Michael; Mather, Douglas Edward; and Williams, Thomas Alan, to Albright & Wilson Ltd. Process for preparing phosphate salts. 4,112,118, Cl. 423-313.000.

Cutler-Hammer, Inc.: *See—*
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,112,458, Cl. 357-38.000.
Piber, Earl T., 4,112,282, Cl. 200-296.000.

Cutter Laboratories, Inc.: *See—*
Cabasso, Victor J., 4,112,068, Cl. 424-89.000.

Cyborg Corporation: *See—*
James, J. Michael; Fee, James F.; and Horton, Richard M., 4,110,918, Cl. 35-22.00R.

Dahl, Klaus J., to Raychem Corporation. Polyketones and methods therefor. 4,111,908, Cl. 528-361.000.

Dahlen, Theodore E.: *See—*
Wells, Thomas R.; and Dahlen, Theodore E., 4,111,537, Cl. 353-101.000.

Dahlman, Goran; and Carlsson, Jan-Erik, to ASEA Aktiebolag. Pressing tool structure for sheet metal forming. 4,111,024, Cl. 72-60.000.

Dahms, Harald. Apparatus for electrophoresis. 4,111,784, Cl. 204-299.0EC.

Dahms, Ronald H., to Monsanto Company. Resole resin binder composition. 4,112,188, Cl. 428-436.000.

Dai Nippon Toryo Co., Ltd.: *See—*
Takase, Katsuji; Tsuji, Toshimoto; Fukuda, Jun-ichi; and Hiyamori, Yasuchika, 4,111,884, Cl. 260-30.60R.

D'Aiello, Robert Vincent, to RCA Corporation. Photovoltaic device having an extended PN junction. 4,112,457, Cl. 357-30.000.

Daikin Kogyo Co., Ltd.: *See—*
Torikai, Eiichi; Kawami, Youji; Kai, Shinichiro; Namba, Mutsusuke; and Simasaki, Shuhei, 4,111,866, Cl. 521-53.000.

Daimler-Benz Aktiengesellschaft: *See—*
Breitschwerdt, Werner; Kania, Sigmund; Ukena, Theodor; and Schwammle, Otto, 4,111,480, Cl. 296-28.00R.
Wiegard, Klaus, 4,111,257, Cl. 165-9.000.

Dake, Timothy William; Clunie, James Spence; and Early, Allen Dale, to Procter & Gamble Company, The. Skin cleansing product having low density wiping zone treated with a lipophilic cleansing emollient. 4,112,167, Cl. 428-154.000.

Dalkov, Poul Flemming, to Skandinavisk Radio & Television Akts. Record player with record determining means. 4,111,431, Cl. 274-9.00A.

Danckaert, Valere Frans: *See—*
Pollet, Robert Joseph; Vandenberghe, Antoon Leon; Danckaert, Valere Frans; Willems, Jozef Frans; and Van Veelen, George Frans, 4,111,697, Cl. 96-66.500.

Dangelmaier, Karl, to L. Schuler GmbH. Aligning and stacking arrangement. 4,111,086, Cl. 83-90.000.

Daniels, Jerry Lee; and Woody, Albert Lloyd, to Caterpillar Tractor Co. Shift modulating control accumulator. 4,111,287, Cl. 192-3.270.

Daniels, Ronald. Non-twisting spinning lure. 4,110,930, Cl. 43-42.140.

Darms, Roland; Kvita, Vratislav; and Greber, Gerd, to Ciba-Geigy Corporation. Crosslinkable tetra-imidyl derivatives and crosslinked polymers therefrom. 4,111,771, Cl. 204-159.220.

Data General Corporation: *See—*
Onnestam, Alf Gunnar, 4,112,501, Cl. 364-900.000.

Datascope Corporation: *See—*
Wolvek, Sidney; Hanson, Bruce L.; and Bregman, David, 4,111,209, Cl. 128-400.000.

Davenport, Bobby E.: *See—*
Nix, Edwin Lee; and Davenport, Bobby E., 4,111,481, Cl. 296-39.00R.

David Kopf Instruments: *See—*
Seiler, William, Jr., 4,111,207, Cl. 128-305.000.

Davis, Donald Colen; Bilger, Alan H.; and Madson, Kent Christ, Jr., to Bendix Autolite Corporation. Protection assembly and ground for gas constituent sensor. 4,111,778, Cl. 204-195.00S.

Davis, Edgar D., to Phillips Petroleum Company. Production of highly aromatic extract oil. 4,111,791, Cl. 208-78.000.

Davis, Gerald Titus; and Shackle, Dale Richard, to Mead Corporation, The. Manifold carbonless form and process for the production thereof. 4,112,138, Cl. 427-54.000.

Davis, Thomas G., to Xerox Corporation. Corona device with segmented shield. 4,112,299, Cl. 250-326.000.

Davison, Ellard D., Jr., to General Motors Corporation. Engine with low friction piston. 4,111,104, Cl. 92-127.000.

Davison, Sol: *See—*
Gergen, William P.; and Davison, Sol, 4,111,894, Cl. 260-40.00R.
Gergen, William P.; and Davison, Sol, 4,111,895, Cl. 260-42.180.
Gergen, William P.; and Davison, Sol, 4,111,896, Cl. 260-42.180.

Dawson, Raymond B., to Super Stud Products, Inc. Locking fastener assembly. 4,111,016, Cl. 70-58.000.

Day, Edward G.; and Dziobek, Edmund, to United Technologies Corporation. Method for making molds and mold components for casting single crystal metallic articles. 4,111,252, Cl. 164-23.000.

Dayer, Francis Louis: *See—*
Mazour, Zdenek; and Dayer, Francis Louis, 4,111,974, Cl. 260-448.80R.

DBX, Inc.: *See—*
Blackmer, David E., 4,112,254, Cl. 179-1.0VL.

Deatcher, John H., to Stauffer Chemical Company. Flame retardant plasticizer formulation for polyvinyl chloride containing dimethyl methylphosphonate for haze reduction. 4,111,882, Cl. 260-30.60R.

Debaigt, Jean, to Cgee Alsthom. Junction block with two fixing orientations. 4,111,517, Cl. 339-198.0GA.

deBarbadillo, John Joseph, II: *See—*
Larson, Floyd Gotthard, Jr.; and deBarbadillo, John Joseph, II, 4,111,691, Cl. 75-170.000.

De Bin, Rene Francois; and Van der Gucht, William, to FMC Corporation. Corner tucking device for laminated sheets. 4,111,739, Cl. 156-486.000.

DeBlasi, Douglas S., to Sun Chemical Corporation. Printing ink resins. 4,111,916, Cl. 528-75.000.

de Cachard, Maurice: *See—*
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,111,260, Cl. 165-104.00S.

Decamp, Rene Paul Auguste: *See—*
Carel, Philippe Robert Raymond; Decamp, Rene Paul Auguste; and Perronin, Jean, 4,112,155, Cl. 427-439.000.

DeChamp, David W.: *See—*
Brishka, Alexander R.; and DeChamp, David W., 4,111,514, Cl. 339-186.00R.

de Cleur, Eckhard; Dhein, Rolf; Rudolph, Hans; and Kreuder, Hans Joachim, to Bayer Aktiengesellschaft. Pulverulent coating agents. 4,112,012, Cl. 260-835.000.

de Cooker, Mario G. R. T., to Stamicarbon, B.V. Process for preparing cyanuric acid. 4,112,232, Cl. 544-192.000.

Decor, Jean-Pierre, to Rhone-Poulenc S.A. Process for the preparation of aromatic aldehydes. 4,111,998, Cl. 260-599.000.

Dee-Mac Construction Co., Inc.: *See—*
DeWitte, Richard Donald, 4,111,366, Cl. 239-222.170.

Deepwater Chemical Co.: *See—*
Garrison, James A., 4,111,991, Cl. 260-583.00P.

de Fremery, Frank P., to N.V. Industrieele Handelscombinatie Holland. Rotatable coupling for a plurality of conduits, particularly for a buoy. 4,111,467, Cl. 285-136.000.

Degen, Ludwig; Viglia, Aurelio; Fascetti, Eugenio; and Perricone, Elena, to Snamprogetti, S.p.A. Method of converting racemic hydantoins into optically active aminoacids. 4,111,749, Cl. 195-2.000.

DeHart, Scott A.: *See—*
Mortensen, Alan Craig; and DeHart, Scott A., 4,112,381, Cl. 328-150.000.

Del Mar Avionics: *See—*
Skidmore, William J., III, 4,111,055, Cl. 73-620.000.

dela Cruz, Luis. Dispensing device. 4,110,853, Cl. 4-227.000.

DeMarco, Thomas M., to NFE International, Ltd. Truck mounted separator apparatus. 4,111,670, Cl. 55-315.000.

Dembiak, Matthew R.; Finnegan, John F.; Reece, Thomas B.; and Rudolph, Howard W., Jr., to Western Electric Company, Inc.; and American Telephone & Telegraph Co., Inc. Gas feeder pipe assembly including electrical conductors. 4,112,247, Cl. 174-16.00R.

DeMent, Hill D., Jr. Peg board game apparatus and method of playing games therewith. 4,111,418, Cl. 273-1.00R.

Demessemaekers, Emiel Mathilde Anna Alfons: *See—*
Spadini, Gianfranco Luigi; and Demessemaekers, Emiel Mathilde Anna Alfons, 4,111,854, Cl. 252-541.000.

Den Hartog, Herman Charles; and Walus, Aloysius Norbert, to Du Pont de Nemours, E. I., and Company. Primer composition of an acrylic epoxy ester graft copolymer, a high molecular weight epoxy resin and a heat reactive condensate. 4,111,870, Cl. 260-21.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Nakajima, Yukihiko; Watanabe, Shuzou; Miyai, Akira; and Ishii, Masaji, 4,112,290, Cl. 219-275.000.

Denney, Jerry W.; and Long, Robert L., to American Monitor Corporation. Creatinine assay and reagent system. 4,111,657, Cl. 23-230.00B.

Dennison Manufacturing Company: *See—*
Bone, Arnold R., 4,111,347, Cl. 227-68.000.

De Nora, Vittorio; Nidola, Antonio; and Spaziante, Placido Maria, to Diamond Shamrock Technologies S.A. Silicon carbide-valve metal borides-carbon electrodes. 4,111,765, Cl. 204-67.000.

Dentsply Research & Development Corp.: *See—*
Gonser, Donald L., 4,112,335, Cl. 315-241.00R.

Dera, Alain, to Regie Nationale des Usines Renault. Quick fastening and adjusting safety clasp especially for safety helmets. 4,110,847, Cl. 2-421.000.

Derbyshire, George Cecil, to Jacobs Manufacturing Company, Limited, The. Keys for drill chucks. 4,111,079, Cl. 81-90.00A.

Deregibus, Alfio D. A. Collapsible tanker hose coupling. 4,111,466, Cl. 285-133.00R.

Derrickson, Charles H.: *See—*
Green, Melvin E.; Derrickson, Charles H.; and Lala, Louis A., 4,111,118, Cl. 101-123.000.

Desai, Kantilal B.: *See—*
Crounse, Nathan N.; and Desai, Kantilal B., 4,111,962, Cl. 260-346.710.

Desormiere, Bernard: *See—*
Hepner, Georges; and Desormiere, Bernard, 4,112,367, Cl. 324-244.000.

Deuterium Corporation: *See—*
Spevack, Jerome S., 4,112,062, Cl. 423-580.00H.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co. Ltd. Noise reduction circuit for a digital tone generator. 4,111,090, Cl. 84-1.010.

de Vaan, Robertus Laurentius Clemens: *See—*
Verbeek, Thomas Geert; and de Vaan, Robertus Laurentius Clemens, 4,112,331, Cl. 315-125.000.

Devine, Donald R.; and Gardiner, William L., to Norton Company. Supporting guide rail for ladder safety device. 4,111,280, Cl. 182-8.000.

Devro, Inc.: *See—*
Greenham, Joseph G.; and Moore, Sanford A. B., 4,110,871, Cl. 17-33.000.

Dewan, Shashi B.: *See—*
Alderman, Arnold N.; and Dewan, Shashi B., 4,112,286, Cl. 219-10.410.

DeWeese, Herbert F. Trap shoot simulator and method. 4,111,423, Cl. 273-101.100.

DeWitte, Richard Donald, to Dee-Mac Construction Co., Inc. Spinner nozzle for use in cooling tower. 4,111,366, Cl. 239-222.170.

deZarauz, Yves, to Compagnie Generale des Etablissements Michelin. Polymerization process. 4,112,210, Cl. 526-187.000.

Dhein, Rolf: *See—*
de Cleur, Eckhard; Dhein, Rolf; Rudolph, Hans; and Kreuder, Hans Joachim, 4,112,012, Cl. 260-835.000.

Diamond Shamrock Corporation: *See—*
Babinsky, Andrew D., 4,112,149, Cl. 427-34.000.

Diamond Shamrock Technologies S.A.: *See—*
De Nora, Vittorio; Nidola, Antonio; and Spaziante, Placido Maria, 4,111,765, Cl. 204-67.000.

Dick, Roy E. Automobile front end alignment equipment. 4,110,913, Cl. 33-336.000.

Dickert, Yancey J.: *See—*
Tomalia, Donald A.; Dickert, Yancey J.; and McCarty, Leslie P., 4,112,067, Cl. 424-78.000.

Dickinson, Thomas: *See—*
Dobson, John Vincent; and Dickinson, Thomas, 4,111,777, Cl. 204-195.00M.

Dickman, Michael D.: *See—*
Folsom, Max H.; and Dickman, Michael D., 4,111,753, Cl. 195-126.000.

Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., to United States Steel Corporation. Process for separating ammonia and acid gases from waste waters containing fixed ammonia salts. 4,111,759, Cl. 203-7.000.

DiEdwardo, Andrew H.; and Dix, Robert, to Celanese Corporation. Process for the production of carbon filaments utilizing an acrylic precursor. 4,112,059, Cl. 423-447.600.

Dierks & Sohne Maschinenfabrik, Firma: *See—*
Melliger, Guido W., 4,111,371, Cl. 241-18.000.

Diesel Equipment Limited: *See—*
Martin, John C.; and Martin, Paul H., 4,111,485, Cl. 298-1.00B.

Digicourse, Inc.: *See—*
Lapeyre, James M., 4,112,424, Cl. 340-336.000.

Digital Data, Inc.: *See—*
Forman, Aubry S.; Schultz, Charles A.; and Schultz, John F., 4,112,369, Cl. 325-34.000.

DiLorenzo, James Vincent: *See—*
Cho, Alfred Yi; DiLorenzo, James Vincent; and Mahoney, Gerard Edward, 4,111,725, Cl. 148-175.000.

di Marco, Aurelio: *See—*
Arcamone, Federico; Bargiotti, Alberto; di Marco, Aurelio; and Penco, Sergio, 4,112,076, Cl. 424-180.000.

Directzia "Uchebno-Technicheski Sredstva": *See—*
Pechev, Miloslav Ivanov; and Shentov, Varban Petrov, 4,111,548, Cl. 355-30.000.

Dix, Robert: *See—*
DiEdwardo, Andrew H.; and Dix, Robert, 4,112,059, Cl. 423-447.600.

Dixon, Dale D.; and Herman, Frederick L., to Air Products & Chemicals, Inc. Allyl esters of N-alkyl-omega-(alkyleneureido) amic acids and their synthesis and use in aqueous emulsion polymer systems. 4,111,877, Cl. 260-29.60R.

Dixon, Eugene H. Coin machine slug rejector. 4,111,292, Cl. 194-101.000.

Dixon, Rolland E., to Phillips Petroleum Company. Parallel alkylation zones with alkylate product and propane removal from a flash zone and a fractionation zone. 4,112,010, Cl. 260-683.480.

Dizon, Edwin S., to Cities Service Company. Combined solar radiation collector and thermal energy storage device. 4,111,189, Cl. 126-400.000.

Djerassi, Isaac. Method of collecting transfusable granulocytes by gravity leukopheresis. 4,111,199, Cl. 128-214.00R.

Dobson, John Vincent; and Dickinson, Thomas, to National Research Development Corporation. Ion-sensitive electrodes. 4,111,777, Cl. 204-195.00M.

Dock Truck, Inc.: *See—*
Blackburn, Keith; and Ross, Douglas, 4,111,273, Cl. 180-14.00R.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Wackerbarth, Folkard, 4,111,758, Cl. 202-138.000.

Doderer, Klaus: *See—*
Ehrmann, Karl; Gerber, Richard; and Doderer, Klaus, 4,111,168, Cl. 123-117.00A.

Dole Refrigeration Company: *See—*
Klotz, Michael C.; and Mei, Viung C., 4,110,997, Cl. 62-81.000.

Dolk, Matti; Era, Vaino; and Lindberg, Jarl Johan. Method for manufacturing polyurethane films and surface coatings from tall oil pitch. 4,112,152, Cl. 427-385.00R.

Dolle, Meinolf, to Spinnstoffabrik Zehlendorf Aktiengesellschaft. Process and equipment for the production of a yarn tail. 4,111,375, Cl. 242-18.0PW.

Dombrowski, Theodor, to Wilhelm Hegenscheidt GmbH. Apparatus for simultaneously measuring the outer diameter of sets of profiled wheels. 4,110,910, Cl. 33-141.00R.

Donaldson, Donald J., to Kaiser Aluminum & Chemical Corporation. Pretreatment system for goethitic bauxites. 4,112,047, Cl. 423-123.000.

Donley, Harold E.; and Cathers, William P., to PPG Industries, Inc. Apparatus for coating an advancing substrate. 4,111,150, Cl. 118-7.000.

Dorsman, Adrian K., to Rockwell International Corporation. Clocked precision integrating analog to digital converter system. 4,112,428, Cl. 340-347.0NT.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Hayashi, Kiyozumi; and Sato, Kenji, 4,111,748, Cl. 176-68.000.
Himeno, Yoshiaki, 4,112,417, Cl. 340-605.000.

Douglas, Philip N., to Cornell-Dubilier Electric Corp. Bidirectional self balancing bridge. 4,112,343, Cl. 318-674.000.

Douwe Egberts Tabaksmaatschappij B.V.: *See—*
Bakker, Jouke, 4,111,212, Cl. 131-21.00A.

Dow Badische Company: *See—*
Postman, William; Louch, James B.; and Buchert, Hermann, 4,111,818, Cl. 252-8.900.

Dow Chemical Company, The: *See—*
Anand, Joginder N., 4,112,203, Cl. 429-104.000.
Baggett, Joseph M.; and Ham, George E., 4,111,899, Cl. 260-45.80R.
Baggett, Joseph M., 4,111,910, Cl. 528196-.
Bozzelli, John W.; Shier, George D.; Pearce, Roscoe L.; and Martin, Charles W., 4,112,049, Cl. 423-226.000.
Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,111,988, Cl. 260-543.00R.
Gunsher, Jeffrey A.; Garner, Joseph L.; and Miller, Conrad O. M., 4,112,209, Cl. 526-65.000.
Heikel, Henrik R.; and Leddy, James J., 4,112,140, Cl. 427-126.000.
Jones, Giffin D., 4,112,207, Cl. 526-17.000.
Kresta, Jiri; and Shen, Chen S., 4,111,914, Cl. 528-48.000.
Najvar, Daniel J., 4,111,770, Cl. 204-159.150.
Paul, George A., 4,111,881, Cl. 260-29.60E.
Redemann, Carl T., 4,111,938, Cl. 260-290.0HL.
Sheahan, James P., 4,110,945, Cl. 52-173.00R.
Tomalia, Donald A.; Dickert, Yancey J.; and McCarty, Leslie P., 4,112,067, Cl. 424-78.000.
Winn, Fred M., Jr.; and Harris, Monty E., 4,111,334, Cl. 221-75.000.

Downer, John D., to Texaco Trinidad Inc. Foliar feeding organometallic composition. 4,111,678, Cl. 71-27.000.

Drabek, Rudolf: *See—*
Steinkopf, Wolfgang Otto Gotthard; and Drabek, Rudolf, 4,112,445, Cl. 358-127.000.

Dragerwerk Aktiengesellschaft: *See—*
Warncke, Ernst; and Gdulla, Manfred, 4,111,197, Cl. 128-142.400.

Draw, Elizabeth: *See—*
Draw, Warren A., 4,112,255, Cl. 179-1.0GQ.

Draw, Warren A., to Draw, Elizabeth, a part interest. Rota-phonic system for stereo quadrophonic sound system. 4,112,255, Cl. 179-1.0GQ.

Dreikorn, Hans Wendell: *See—*
Hannes, George John; Rohweder, Theodore Richard; Dreikorn, Hans Wendell; and Shepherd, Philip Bickford, 4,112,174, Cl. 428-220.000.

Dresser Industries, Inc.: *See—*
Bryant, Lorton W., 4,111,042, Cl. 73-194.00M.
Stratienko, Andrew, 4,111,070, Cl. 74-625.000.

Drisan Packaging Ltd.: *See—*
Jarvis, Alexander S., 4,112,124, Cl. 426-234.000.

D'Silva, Themistocles D. J., to Union Carbide Corporation. N-Substituted alkanesulfenyl-N-alkyl and N-substituted alkanethio-sulfenyl-N-alkyl carbamoyl halide compounds. 4,111,989, Cl. 260-544.00C.

D'Silva, Themistocles Damasceno Joaquim: *See—*
Durden, John Apling; and D'Silva, Themistocles Damasceno Joaquim, 4,111,955, Cl. 260-327.00M.

Dubik, Adam; Kowalski, Henryk Zenon; Osiennik, Pawel; and Krol, Franciszek, to Instytut Geodezji i Kartograffi. Apparatus for direct measurement of displacements with a holographic scale. 4,112,295, Cl. 250-237.00G.

Dubois, Jean Claude; and Barre, Francoise, to Thomson-CSF. Mesogenic biphenyl benzoates. 4,112,239, Cl. 560-73.000.

Duensing, Willard John; and Miga, Christian John, to Johns-Manville Corporation. Cooking oil treating system and composition therefor. 4,112,129, Cl. 426-417.000.

Duffy, James B.: *See—*
Peterson, Palmer L.; Duffy, James B.; and Tokarz, Richard D., 4,111,798, Cl. 209-172.500.

Duistermaat, Jan Hendrik; and van Nes, Johannes Cornelis Adrianus, to U.S. Philips Corporation. Method for manufacturing the picture display screen of a color television tube using a cylinder lens. 4,111,694, Cl. 96-36.100.

Dulaquais, Pierre, to Creusot-Loire. Manufacture of pipe stubs in walls of very great thickness. 4,111,029, Cl. 72-342.000.

Dumont, Anton: *See—*
Biegel, Peter; and Dumont, Anton, 4,111,403, Cl. 266-58.000.

Dumont, Claude; and Oberlander, Claude, to Roussel Uclaf. Stimulating dopaminerginic activity. 4,112,093, Cl. 424-250.000.

Duncan, Grant, to Smith International, Inc. Junk boot. 4,111,262, Cl. 166-99.000.

Dunjushkin, Mikhail Grigorievich: *See—*
Buzhinsky, Vladimir Lukyanovich; Raschepkin, Konstantin Egorovich; Dunjushkin, Mikhail Grigorievich; Lysogorsky, Gennady Tikhonovich; Valeev, Rustem Ibragimovich; Nisenbaum, Yakov Arkadievich; and Ikhsanov, Deviz Faizrakhmanovich, 4,110,862, Cl. 15-88.000.

Dunlop, James D.; and Stockel, Joseph, to Communications Satellite Corporation. Lanthanum nickel hydride-hydrogen/metal oxide cell. 4,112,199, Cl. 429-29.000.

Dunnigan, Daniel Ambrose: *See—*
Winn, Martin; Kyncl, Jaroslav; Dunnigan, Daniel Ambrose; and Jones, Peter Hadley, 4,112,097, Cl. 424-251.000.

Du Pont de Nemours, E. I., and Company: *See—*
Briggs, Paul Clayton, Jr.; and Muschiatti, Lawrence Carl, 4,112,013, Cl. 260-878.00R.
Den Hartog, Herman Charles; and Walus, Aloysius Norbert, 4,111,870, Cl. 260-21.000.
Goddard, Steven Jerome, 4,111,681, Cl. 71-92.000.
Moulds, Gordon Mars, 4,112,016, Cl. 260-849.000.
Sam, Donnie Joe, 4,111,960, Cl. 260-340.90R.
Stiles, Alvin B., 4,111,847, Cl. 252-463.000.

Durant, Graham John; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Pharmacologically active compounds. 4,112,104, Cl. 424-270.000.

Durden, John Apling; and D'Silva, Themistocles Damasceno Joaquim, to Union Carbide Corporation. N-Trihalomethanesulfenyl carbamoyloximino di-sulfur heterocyclic compounds. 4,111,955, Cl. 260-327.00M.

Duval, Jean-Claude; Mottini, Francis Joseph; Touron, Serge Auguste; Rennard, Jean-Jacques Francois; and Duval, Ruchela Marie, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull. Read-only-memory with shunt path to divert programming current. 4,112,505, Cl. 365-96.000.

Duval, Ruchela Marie: *See*—
Duval, Jean-Claude; Mottini, Francis Joseph; Touron, Serge Auguste; Rennard, Jean-Jacques Francois; and Duval, Ruchela Marie, 4,112,505, Cl. 365-96.000.

Dvirka, Miro. Spray cooling temperature control system. 4,110,999, Cl. 62-171.000.

Dvorak, Antonin J., to General Electric Company. Hydraulic gimbal system for beam projection lamps. 4,111,562, Cl. 356-244.000.

Dworak, Gert. Process for producing water-soluble binders for electrodeposition. 4,111,872, Cl. 260-23.70A.

Dynamit Nobel Aktiengesellschaft: *See*—
Bier, Gerhard; Blaschke, Franz; aus der Funten, Helmut; and Schade, Gerhard, 4,111,921, Cl. 528-338.000.
Hulsmann, Hans Leo; and Renckhoff, Gustav, 4,112,240, Cl. 560-112.000.
Richtzenhain, Hermann; and Schrage, Klaus, 4,111,902, Cl. 260-45.80A.
Weissenfels, Franz; and Junger, Hans, 4,111,911, Cl. 260-38.000.
Wulff, Gunter; and Sarhan, Ali, 4,111,863, Cl. 521-63.000.

Dziobek, Edmund: *See*—
Day, Edward G.; and Dziobek, Edmund, 4,111,252, Cl. 164-23.000.

E. R. Squibb & Sons, Inc.: *See*—
Breuer, Hermann; and Treuner, Uwe, 4,111,978, Cl. 260-465.00D.
Hoehn, Hans; Bernstein, Jack; and Vogt, Berthold Richard, 4,111,940, Cl. 260-293.600.
Ondetti, Miguel Angel; and Cushman, David W., 4,112,119, Cl. 424-317.000.
Vogt, B. Richard, 4,112,096, Cl. 424-251.000.
Vogt, B. Richard, 4,112,098, Cl. 424-251.000.

Eager, George S., Jr.: *See*—
Bahder, George; Eager, George S., Jr.; and Suarez, Rafael, 4,112,354, Cl. 324-54.000.

Early, Allen Dale: *See*—
Dake, Timothy William; Clunie, James Spence; and Early, Allen Dale, 4,112,167, Cl. 428-154.000.

Eash, Robert E.: *See*—
Burkart, Robert C.; and Newbould, Gilbert J., 4,111,590, Cl. 408-14.000.

Easley, Steven J., to Texas Instruments Incorporated. Electronic calculator or microprocessor having a selectively loadable instruction register. 4,112,495, Cl. 364-700.000.

Eastman Kodak Company: *See*—
Asker, Graham Edward, 4,112,451, Cl. 354-258.000.
Harvey, Donald Malcolm, 4,112,454, Cl. 354-330.000.
Hutchison, William Joseph, 4,112,453, Cl. 354-330.000.
Krueger, Spencer Milton, 4,111,699, Cl. 96-87.00R.
McConnell, Richard L.; and Weemes, Doyle A., 4,112,208, Cl. 526-57.000.
Mir, Jose Manuel; and Varner, Jerry Reubon, 4,112,437, Cl. 346-159.000.
Newland, Gordon C.; and Pacifici, James G., 4,112,182, Cl. 428-336.000.
Owens, James Carl, 4,112,461, Cl. 358-63.000.
Patton, David Lynn, 4,112,452, Cl. 354-322.000.
Salsich, Robert Charles; and Bartell, Roger Edwin, 4,112,280, Cl. 219-216.000.
Schaeffer, James Robert; Snoke, Roy Eugene; and Harris, Harry Wayne, 4,111,838, Cl. 252-430.000.
Wright, Hal Eldon; and Berwick, Martin Alfred, 4,111,693, Cl. 96-1.600.

Eastman, Larry Bruce: *See*—
Kenigsberg, Irwin Jeffrey; and Eastman, Larry Bruce, 4,111,386, Cl. 244-17.270.

Easton, George Anthony: *See*—
Badertscher, Ernest; and Easton, George Anthony, 4,112,132, Cl. 426-603.000.

Eaton Corporation: *See*—
Larson, Gerald L.; and O'Neil, Walter K., 4,112,365, Cl. 324-173.000.

Eck, John E.; and Kasberg, Alvin H., to United States of America, Energy. Packed rod neutron shield for fast nuclear reactors. 4,111,747, Cl. 176-40.000.

Eckelman, Larry D.: *See*—
Bradley, Bruce R.; Eckelman, Larry D.; and Gilmer, Donald G., 4,110,965, Cl. 57-157.0TS.

Eckert, Heiner; Ugi, Ivar; and Kabbe, Hans-Joachim, to Bayer Aktiengesellschaft. Protection of functional groups during reaction and their subsequent restoration. 4,111,933, Cl. 260-239.100.

Ecosol, Ltd.: *See*—
Lebduska, John Lawrence, 4,111,259, Cl. 237-1.00A.

Edbro Limited: *See*—
Webster, Raymond George, 4,111,321, Cl. 214-501.000.

Edelman, Abraham: *See*—
Marx, Alvin J.; and Edelman, Abraham, 4,111,198, Cl. 128-214.00E.

Edelman, Leonard E.: *See*—
Sprengling, Gerhard R.; and Edelman, Leonard E., 4,111,715, Cl. 134-10.000.

Edelman, Robert: *See*—
Shaner, Jay R.; and Edelman, Robert, 4,111,887, Cl. 260-37.0AL.

Edelmann, Gunther, to Braukmann Armaturen AG. Valve, especially a radiator valve. 4,111,392, Cl. 251-214.000.

Eder, Hans: *See*—
Gundlach, Arnold; and Eder, Hans, 4,111,389, Cl. 248-162.000.

Ederer, Georg; Fischer, Adolf; Rosche, Paul; Troll, Helmar; Wurst, Wolfgang; Hengl, Helmut; and Seidl, Jiri, to Bayerische Motoren Werke AG. Air induction system for an internal combustion engine. 4,111,163, Cl. 123-52.00M.

Edsbyns Industri AB: *See*—
Haggblom, Per, 4,110,933, Cl. 47-57.500.

Edwards, Edwin N.: *See*—
Bosy, George; Edwards, Edwin N.; Hoffbeck, Willis M.; Silvio, Paul A.; and Warwick, Leonard A., 4,112,131, Cl. 426-582.000.

Eggert, Hans Joachim; Oberberger, Otto; Zenkert, Heinrich; and Kuehne, Rudi, to Siemens Aktiengesellschaft. Prefabricated housing for electrical components. 4,111,328, Cl. 220-4.00R.

Eggimann, Fritz: *See*—
Benninger, Hans; Eggimann, Fritz; and Enkegaard, Ole, 4,112,476, Cl. 361-42.000.

Ehrmann, Karl; Gerber, Richard; and Doderer, Klaus, to Robert Bosch GmbH. Ignition distributor-circuit breaker assembly for internal combustion engines. 4,111,168, Cl. 123-117.00A.

Eichler, Kenneth M.: *See*—
Winkler, Charles L.; and Eichler, Kenneth M., 4,111,284, Cl. 187-29.00R.

Eiland, P. Frank: *See*—
Spanel, Abram N.; Eiland, P. Frank; and Jacobs, David R., 4,111,136, Cl. 112-79.00R.

Eimers, Erich: *See*—
Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Fischler, Hans-Michael; and Eimers, Erich, 4,112,018, Cl. 260-861.000.

Einhorn, Ruediger; Chasen, Lee Richard; and Blake, Joseph Walter, III, to Coats & Clark, Inc. Glass cutter. 4,110,907, Cl. 30-164.950.

Eisele, Franz X., to Hughes Aircraft Company. Cathode structure and method. 4,112,327, Cl. 313-337.000.

Ekstrom, Olov Valter: *See*—
Jonsson, Sven Erik; and Ekstrom, Olov Valter, 4,112,272, Cl. 200-61.58R.

Elam, Richard C.; and Ulion, Nicholas E., to United Technologies Corporation. Fabrication of Co-Cr-Al-y feed stock. 4,110,893, Cl. 29-420.500.

Elastometal Limited: *See*—
Fyfe, Edward, 4,111,584, Cl. 404-69.000.

Electric Power Research Institute, Inc.: *See*—
Hower, Philip L.; Carlson, William G.; and Gupta, Tapan K., 4,112,362, Cl. 324-158.00R.
Wolk, Ronald H.; and Stewart, Norman C., 4,111,663, Cl. 422-191.000.

Electrohome Limited: *See*—
Wan, John P., 4,112,321, Cl. 310-242.000.

Elitex, Koncern textilniho strojirenstvi: *See*—
Svaty, Vladimir, 4,111,239, Cl. 139-438.000.

Ellenberger & Poensgen GmbH: *See*—
Heydner, Konrad, 4,111,474, Cl. 292-144.000.

Eller, Robert: *See*—
Krueger, Theodore H., Jr.; Eller, Robert; O'Brien, John; and Robbins, William L., 4,111,255, Cl. 164-255.000.

Elliott Brothers (London) Limited: *See*—
Ellis, Stafford Malcolm, 4,111,555, Cl. 356-141.000.

Elliott, Curtis Homer, Jr., to W. R. Grace & Co. Hydrosol and catalyst preparation. 4,111,846, Cl. 252-455.00Z.

Elliott, Harry Samuel, to Varco, Inc. Solid state controller. 4,112,342, Cl. 318-599.000.

Elliott, J. Kelly; and Crawford, Douglas W., to Schlumberger Technology Corporation. Gas lift system. 4,111,608, Cl. 417-112.000.

Elliott, Kenneth: *See*—
Elliott, Peter; and Elliott, Kenneth, 4,112,494, Cl. 364-510.000.

Elliott, Peter; and Elliott, Kenneth. Refinery and pipeline monitoring system. 4,112,494, Cl. 364-510.000.

Ellis, Michael W. Surface treatment of fibrous substances. 4,112,144, Cl. 427-223.000.

Ellis, Stafford Malcolm, to Elliott Brothers (London) Limited. Apparatus for measuring the angular displacement of a body. 4,111,555, Cl. 356-141.000.

Ellzey, Samuel E., Jr.: *See*—
Connick, William J., Jr.; and Ellzey, Samuel E., Jr., 4,111,700, Cl. 106-2.000.

Elsner, Peter, to Siemens Aktiengesellschaft. Method for refreshing storage contents of MOS memories. 4,112,513, Cl. 365-222.000.

Emerson Electric Co.: *See*—
Scott, Walter W., deceased, 4,111,640, Cl. 431-46.000.

EMI Limited: *See*—
Randall, Robert Paul, 4,112,397, Cl. 250-401.000.

Emmett, Lionel C. R., to Emmett, Lionel C. R. Intrauterine contraceptive device of C or omega form with tubular inserter and method of placement. 4,111,196, Cl. 128-130.000.

Enami, Mamoru: *See*—
Fukuda, Shozo; Seike, Yajuro; Iizuka, Masafumi; Kasai, Hironao; and Enami, Mamoru, 4,111,811, Cl. 210-242.00S.

Enders, Edgar; Stendel, Wilhelm; and Voege, Herbert, to Bayer Aktiengesellschaft. Compositions of bis(ortho-substituted phenyl)carbodiimides and quaternary ammonium salts and their use thereof in combatting ectoparasitic tick infestations of animals. 4,112,065, Cl. 424-45.000.

Energy Resources Co. Inc.: *See*—
Baddour, Raymond F., 4,111,812, Cl. 210-257.00M.

Energy Services Inc.: *See*—
Haeflich, Jack; and Christman, Peter C., 4,110,973, Cl. 60-39.050.

Engelhard, Philippe: *See*—
Weisang, Joseph-Edouard; and Engelhard, Philippe, 4,111,841, Cl. 252-439.000.

Engleke, Donald J. Double walled smokestack apparatus. 4,111,107, Cl. 98-60.000.

Engler, Edward Martin; Nichols, Kenneth Herbert; Patel, Vishnubhai Vitthalbhai; Rivera, Nilda Martinez; and Schumaker, Robert Rhees, to International Business Machines Corporation. Highly conducting organometallic polymers. 4,111,857, Cl. 528-226.000.

English, Austin L., to Weyerhaeuser Company. One-piece chair shipping container. 4,111,301, Cl. 206-326.000.

Enkegaard, Ole: *See—*
Benninger, Hans; Eggimann, Fritz; and Enkegaard, Ole, 4,112,476, Cl. 361-42.000.

Enoki, Toshio: *See—*
Murayama, Naohiro; Fukuda, Makoto; Sakagami, Teruo; Suzuki, Shirou; Kokubu, Yoshikazu; and Enoki, Toshio, 4,111,780, Cl. 204-266.000.

Enoksson, Bertil Petrus, to Nitro Nobel AB. Electrified fence. 4,111,400, Cl. 256-47.000.

Entreprise d'Equipements Mecaniques et Hydrauliques EMH: *See—*
Vilain, Robert, 4,111,435, Cl. 277-9.000.

Environmental Research & Technology, Inc.: *See—*
Blau, Henry H., Jr.; and Kebabian, Paul L., 4,111,731, Cl. 156-86.000.
Blau, Henry H., Jr.; and Kebabian, Paul L., 4,112,028, Cl. 264-1.000.

Epps, L. Macon, to Raymond Lee Organization, Inc., The, a part interest. Combined water heater and sauna room heater device. 4,112,281, Cl. 219-283.000.

Epstein, David; and Bugg, John, to White Sea & Baltic Company Limited, The. Foundry processes and compositions. 4,111,253, Cl. 164-43.000.

Epstein, Edward: *See—*
Chesnut, Jon C.; and Epstein, Edward, 4,112,125, Cl. 426-250.000.

Epstein, Norman. Combination lock. 4,111,014, Cl. 70-25.000.

Era, Vaino: *See—*
Dolk, Matti; Era, Vaino; and Lindberg, Jarl Johan, 4,112,152, Cl. 427-385.00R.

Ericson, Richard A.: *See—*
Lerner, Melvin; and Ericson, Richard A., 4,111,049, Cl. 73-421.50R.

Ernst Leitz Wetzlar GmbH: *See—*
Fuehrer, Werner; Huttel, Richard; Lisfeld, Robert; and Leonhardt, Karl, deceased, 4,111,530, Cl. 350-252.000.

Ernst, Richard A.: *See—*
Vennemeyer, Alfred C.; and Ernst, Richard A., 4,111,031, Cl. 72-359.000.

Esboldt, Richard J.: *See—*
Strand, Neal T.; and Esboldt, Richard J., 4,110,925, Cl. 40-466.000.

Escher Wyss Limited: *See—*
Biondetti, Mario, 4,111,746, Cl. 162-272.000.

Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,112,229, Cl. 544-105.000.

Etablissement Gelan: *See—*
Fross, Arthur E., 4,112,060, Cl. 423-450.000.

Etablissement Public dit "Telediffusion de France": *See—*
Gautier, Christian Jean; Marti, Bernard; Mauduit, Michel Robert; Louineau, Andre Jean-Francois; and Schwartz nee Luneau, Christiane, 4,112,459, Cl. 358-6.000.

Ethyl Corporation: *See—*
Hayes, Thomas H., 4,111,367, Cl. 239-333.000.
Tesoro, Giuliana C., 4,111,652, Cl. 8-116.00P.

Etoh, Kuniomi; Tanaka, Shinichi; Kato, Yoshio; and Kazuo, Watanabe, to Toyo Boseki Kabushiki Kaisha. Electrostatic printing plate. 4,111,692, Cl. 96-1.00R.

Eubanks, Lloyd S.; and Price, Jerry L., to Monsanto Company. Coproduction of acetic and propionic acids. 4,111,982, Cl. 562-519.000.

Evans, A. Gary, to United States of America, Energy. Activated carbon material. 4,111,833, Cl. 252-429.00R.

Everhart, Norman; and Brauer, Dieter Bruno, to Jerrold Electronics Corp. Modular radio frequency amplifier having a gain variable by external passive component selection. 4,112,386, Cl. 330-265.000.

Everswick, David N., to United States of America, Army. Pulse amplitude and width detection system. 4,112,317, Cl. 307-308.000.

Everswick, David N.: *See—*
Smith, Chester L.; and Everswick, David N., 4,111,559, Cl. 356-201.000.

Ewanus, Walter; and Sage, Gerald F., to Westinghouse Electric Corp. Constant amplitude carrier communications system. 4,112,368, Cl. 325-32.000.

Exxon Nuclear Company, Inc.: *See—*
Maness, Roy F., 4,111,831, Cl. 422-12.000.

Exxon Production Research Company: *See—*
Jahns, Hans O.; Galate, Joseph W.; and Wheeler, John A., Jr., 4,111,258, Cl. 165-40.000.

Exxon Research & Engineering Co.: *See—*
Aldridge, Clyde L.; and Bearden, Roby, Jr., 4,111,787, Cl. 208-10.000.
Cahn, Robert P.; and Nicholson, Edward W., 4,110,987, Cl. 60-652.000.
Mueller, Wolfgang H.; Oswald, Alexis A.; and Hall, Daniel N., 4,112,024, Cl. 260-956.000.
Nelson, Richard L., 4,112,468, Cl. 358-280.000.
Sartori, Guido; and Leder, Frederic, 4,112,050, Cl. 423-223.000.
Sartori, Guido; and Leder, Frederic, 4,112,051, Cl. 423-223.000.
Sartori, Guido; and Leder, Frederic, 4,112,052, Cl. 423-228.000.
Sullivan, Daniel S., 3rd; Strubelt, Charles E.; and Becker, Kenneth W., 4,112,001, Cl. 568-855.000.
West, Theodore H., 4,111,790, Cl. 208-33.000.

Eymond, Philip Richard Norman, to Lever Brothers Company. Process for removing non-fluorescent triazine derivative impurities from fluorescent agents. 4,112,226, Cl. 542-461.000.

Facit Aktiebolag: *See—*
Stenudd, Sven Gunnar Valter, 4,110,884, Cl. 29-163.50R.

Fahey, Darryl R.; and Mahan, John E., to Phillips Petroleum Company. Organophosphorus nickel complexes and use thereof. 4,111,972, Cl. 260-439.00R.

Fahlvik, Hans Anders; and Fahlvik, Nils Arne, to Aktiebolaget Electrolux. Autoclave apparatus and method for sterilization of articles. 4,111,654, Cl. 422-26.000.

Fahlvik, Nils Arne: *See—*
Fahlvik, Hans Anders; and Fahlvik, Nils Arne, 4,111,654, Cl. 422-26.000.

Fair, John H. Apparatus for sludge digestion. 4,111,808, Cl. 210-197.000.

Falcioni, Joseph G., to Boeing Company, The. Continuously curved fastener head and countersink have interference fit. 4,111,580, Cl. 85-9.00R.

Falkenberg, Leigh: *See—*
Porteous, Kenneth; Falkenberg, Leigh; and Lane, Stephen, 4,111,789, Cl. 208-11.0LE.

Far-Mar-Co, Inc.: *See—*
Rao, Ganta V.; Shoup, Floyd K.; and Popenhagen, Gerald R., 4,112,133, Cl. 426-650.000.

Farcy, Jean-Claude, to Compagnie Generale d'Electricite S.A. Laser generator device emitting at a wavelength close to 1.3 microns. 4,112,390, Cl. 331-94.50G.

Farina, Samuel T.: *See—*
Reghi, Gary A.; and Farina, Samuel T., 4,111,722, Cl. 148-6.15R.

Farquharson, Stuart Connall: *See—*
Varvel, David Anthony; Millar, Frederick William; and Farquharson, Stuart Connall, 4,112,292, Cl. 235-449.000.

Farrant, David John Rowland, to Automotive Products Limited. Ball and socket joints. 4,111,571, Cl. 403-27.000.

Farrenkopf, Bruce Charles; and Gomez, Magdalena Usategui, to Hoffmann-La Roche Inc. Stabilized angiotensin I solutions. 4,112,064, Cl. 424-1.000.

Fascetti, Eugenio: *See—*
Degen, Ludwig; Viglia, Aurelio; Fascetti, Eugenio; and Perricone, Elena, 4,111,749, Cl. 195-2.000.

Fasching, James L.: *See—*
Frechette, Michael W.; and Fasching, James L., 4,111,036, Cl. 73-23.000.

Fasth, Ulf Kenneth Folke, to AB Fast-Devel. Fastening device. 4,111,096, Cl. 85-11.000.

Fath, Horst; and Nill, Reiner, to BBC Brown, Boveri & Company Limited. Drive and brake circuit for speed controlled DC motors. 4,112,341, Cl. 318-370.000.

Faulkner, Richard Dale, to RCA Corporation. Electron discharge tube having a cup-shaped secondary electron emissive electrode. 4,112,325, Cl. 313-95.000.

Faulkner, Richard Dale, to RCA Corporation. Non-uniform dynode mesh for an electron discharge tube. 4,112,326, Cl. 313-95.000.

Fausett, A. Wayne: *See—*
Collins, Steven; and Fausett, A. Wayne, 4,111,353, Cl. 229-34.00R.

Faust, Richard C.: *See—*
Reiher, Max A. W.; and Faust, Richard C., 4,111,313, Cl. 214-15.00R.

Fawkes, David Melville, to Imperial Chemical Industries Limited. Tetrahydroquinoline azo triazole dyestuffs. 4,111,929, Cl. 260-146.00R.

Fedor, Robert J., to Gould Inc. Low copper NO_x reduction catalyst. 4,111,849, Cl. 252-474.000.

Fee, James F.: *See—*
James, J. Michael; Fee, James F.; and Horton, Richard M., 4,110,918, Cl. 35-22.00R.

Feehan, John Desmond: *See—*
Plate, Dieter Erich Alexander; and Feehan, John Desmond, 4,110,963, Cl. 57-86.000.

Fehr, Rudolph: *See—*
Thompson, Isadore; and Fehr, Rudolph, 4,110,990, Cl. 405-14.000.

Feingold, Michael; and Sparks, John, to New England Industrial Chemical Co. Process and apparatus for removing ethylene oxide from gas compositions. 4,112,054, Cl. 423-245.000.

Feistel, Gerald R.; and Pessimisis, George N., to Nalco Chemical Company. Silica-alumina and silica catalyst support bodies. 4,111,843, Cl. 252-451.000.

Felt Products Mfg. Co.: *See—*
Brady, John F.; and McDowell, Donald J., 4,111,583, Cl. 404-69.000.

Feltner, William R.: *See—*
Hollis, Ben R., Jr.; Feltner, William R.; Bouldin, David L.; and Routh, Donald E., 4,111,775, Cl. 204-192.00C.

Felzer, Bertold: *See—*
Arnold, Willi; Pflughaupt, Rolf; and Felzer, Bertold, 4,111,456, Cl. 280-692.000.

Fenton, Alvin P.; Gault, Roger T.; and Bernauer, Lawrence J., to Kohler Co. Engine shutdown control. 4,111,176, Cl. 123-198.0DB.

Ferguson, Eric Tapley: *See—*
Van Mal, Harmannus Hinderikus; and Ferguson, Eric Tapley, 4,111,002, Cl. 62-467.00R.

Ferranti Limited: *See—*
Nutter, Geoffrey; and McGibbon, William, 4,112,487, Cl. 364-200.000.

Ferrara, Angelo: *See—*
Ricciardi, Ronald J.; Ferrara, Angelo; Hartmann, Joseph L.; and Lauterbach, Gary R., 4,111,272, Cl. 177-50.000.
Fessler, Julius H. Process of cold stabilizing wine. 4,112,128, Cl. 426-330.400.
Fetterman, Charles P., to Consumers Digital Systems Corp. Beverage dispensing device. 4,111,243, Cl. 141-102.000.
Ficken, Kent L. Fibered synthetic clay composition for use in aesthetic arts. 4,111,868, Cl. 260-17.4ST.
Field, John H., to Sigma Instruments, Inc. Synchronous motor with heterogeneously pitched teeth. 4,112,319, Cl. 310-49.00R.
Field, Roger; and Steger, Thomas. String instrument, in particular a guitar with foldable neck portion. 4,111,093, Cl. 84-267.000.
Fillwalk, Frank: *See—*
Butterworth, George A. M.; and Fillwalk, Frank, 4,112,153, Cl. 427-390.00E.
Finan, Michael Anthony: *See—*
Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,111,804, Cl. 210-58.000.
Finley, Joseph H.: *See—*
Blumbergs, John H.; Finley, Joseph H.; and Baum, Burton M., 4,111,651, Cl. 8-111.000.
Finnegan, John F.: *See—*
Dembiak, Matthew R.; Finnegan, John F.; Reece, Thomas B.; and Rudolph, Howard W., Jr., 4,112,247, Cl. 174-16.00R.
Firing Circuits, Inc.: *See—*
Alderman, Arnold N.; and Dewan, Shashi B., 4,112,286, Cl. 219-10.410.
Firth, Jack Graham; Gentry, Stephen John; and Jones, Alan, to National Research Development Corporation. Catalytic gas detectors. 4,111,658, Cl. 23-232.00E.
Fiscelli, Nicolino: *See—*
Foschini, Giorgio; Fiscelli, Nicolino; and Galli, Paolo, 4,111,835, Cl. 252-429.00C.
Fischer, Adolf: *See—*
Ederer, Georg; Fischer, Adolf; Rosche, Paul; Troll, Helmar; Wurst, Wolfgang; Hengl, Helmut; and Seidl, Jiri, 4,111,163, Cl. 123-52.00M.
Fischer, Artur; and Fischer, Klaus, to Fischer, Artur. Drilling assembly. 4,111,270, Cl. 175-220.000.
Fischer, Earl R.; and Gural, John A., to General Motors Corporation. Two-stage vacuum motor. 4,111,099, Cl. 91-173.000.
Fischer, Klaus: *See—*
Fischer, Artur; and Fischer, Klaus, 4,111,270, Cl. 175-220.000.
Fischler, Hans-Michael: *See—*
Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Fischler, Hans-Michael; and Eimers, Erich, 4,112,018, Cl. 260-861.000.
Fisher Gauge Limited: *See—*
Fisher, William Frederick, 4,110,885, Cl. 29-239.000.
Fisher, John T. Bathtub drain and overflow testing apparatus. 4,111,037, Cl. 73-40.50R.
Fisher, William Frederick, to Fisher Gauge Limited. Encapsulating block and removal apparatus. 4,110,885, Cl. 29-239.000.
Fishwick, Brian Ribbons: *See—*
Baird, David Boyd; Campbell, James Stanley; Fishwick, Brian Ribbons; and McClelland, Robert David, 4,111,956, Cl. 260-329.0AM.
Fitchman, Arthur Emil: *See—*
Klein, Gerhart Paul; Oliver, John N.; and Fitchman, Arthur Emil, 4,111,155, Cl. 118-642.000.
Fitz, Herbert: *See—*
Kuhls, Jurgen; Steininger, Alfred; and Fitz, Herbert, 4,112,211, Cl. 526-219.000.
Fitzner, Arthur O.; and Sleder, Richard L., to Brunswick Corporation. Ignition system with idle speed governor apparatus. 4,111,174, Cl. 123-148.0CC.
Fives-Cail Babcock: *See—*
Ghestem, Gerard, 4,110,915, Cl. 34-20.000.
Flanagan, Brian S.; Turner, Phillip L.; Broce, Richard D.; and Lagus, Peter L., to Systems, Science and Software. Gas monitor. 4,112,302, Cl. 250-381.000.
Flannery, James E.; and Wexell, Dale R., to Corning Glass Works. Machinable glasses. 4,111,708, Cl. 106-53.000.
Fleming, Robert Willerton, to Parke, Davis & Company. Antiarrhythmic (+,−)-cis-α-[3-(2,6-dimethyl-1-piperidinyl)propyl]-α-phenyl-2-pyridinemethanols. 4,112,103, Cl. 424-267.000.
Flesher, Robert W. Water pipe. 4,111,214, Cl. 131-173.000.
Flexible Steel Lacing Company: *See—*
Pray, Winston C., 4,111,080, Cl. 29-243.510.
Flow Technology, Inc.: *See—*
Guthrie, James F.; and Zimmerman, Richard E., 4,111,043, Cl. 73-197.000.
FMC Corporation: *See—*
Blumbergs, John H.; Finley, Joseph H.; and Baum, Burton M., 4,111,651, Cl. 8-111.000.
De Bin, Rene Francois; and Van der Gucht, William, 4,111,739, Cl. 156-486.000.
Gunnarsson, Arne Nils, 4,110,864, Cl. 15-340.000.
Knight, Houston W., 4,111,465, Cl. 285-114.000.
Fogelberg, Mark John, to Borg-Warner Corporation. Gear changing mechanism. 4,111,288, Cl. 192-38.000.
Foll, Eberhard; and Vetter, Helmut, to Polymer-Physik GmbH & Co. KG. Electron beam source with an electron exit window connected via a window flange. 4,112,307, Cl. 250-510.000.
Folsom, Max H.; and Dickman, Michael D., to National Appliance Company. Controlled atmosphere apparatus and method of transferring specimens to same. 4,111,753, Cl. 195-126.000.
Fonzi, Frank, to Materials Technology Corporation. Method of co-deposit coating aluminum oxide and titanium oxide. 4,112,148, Cl. 427-248.00C.
Ford, Gary P.: *See—*
Mutzner, John E.; and Ford, Gary P., 4,111,237, Cl. 138-125.000.
Ford, Wilson; and Gagnon, John Temple, to Coors Porcelain Company. Stepped cone draw block. 4,111,026, Cl. 72-289.000.
Forman, Aubry S.; Schultz, Charles A.; and Schultz, John F., to Digital Data, Inc. Secure SCA broadcasting system including subscriber actuated portable receiving terminals. 4,112,369, Cl. 325-34.000.
Formica Corporation: *See—*
Huffman, Kenneth Robert; Casey, Donald James; and Thomas, Walter Moreland, 4,112,169, Cl. 428-206.000.
Foschini, Giorgio; Fiscelli, Nicolino; and Galli, Paolo, to Montedison S.p.A. Catalysts for polymerizing olefins to spheroidal-form polymers. 4,111,835, Cl. 252-429.00C.
Fosnough, Robert D.; and Nelson, Max A., to Controls, Inc. Radio channel display and method of display. 4,112,376, Cl. 325-455.000.
Foster, Edson Perkins, to Foster Needle Company. Swaged needle. 4,110,875, Cl. 28-115.000.
Foster Needle Company: *See—*
Foster, Edson Perkins, 4,110,875, Cl. 28-115.000.
Foster, Stephen James: *See—*
Arya, Satya Prakash; Ballard, Albert Stevens; and Foster, Stephen James, 4,111,335, Cl. 222-57.000.
Foulke, Willing B. Apparatus for producing mechanical kinetic energy from falling water. 4,110,980, Cl. 60-325.000.
Fraik, Robert D., to Minnesota Mining and Manufacturing Company. Hidden entry or latent image methods and systems. 4,111,702, Cl. 106-19.000.
Franko-Filipasic, Borivoj Richard; Orwoll, Edward F.; and Patel, Vithal C., to Avtex Fibers Inc. Flame retardant regenerated cellulose filaments containing cross-linked polymeric phosphazenes. 4,111,701, Cl. 106-15.0FP.
Franz Kuhlmann KG.: *See—*
Gundlach, Arnold; and Eder, Hans, 4,111,389, Cl. 248-162.000.
Frayer, James A.: *See—*
Yanik, Stephen J.; Montagna, Angelo A.; and Frayer, James A., 4,111,796, Cl. 208-216.000.
Frechette, Michael W.; and Fasching, James L., to State of Rhode Island, The Board of Regents for Education of the. Piezoelectric probe for detection and measurement of gaseous pollutants. 4,111,036, Cl. 73-23.000.
Frederick, Edwin: *See—*
Annis, Martin; Bjorkholm, Paul; Cobb, Carolus M.; Frederick, Edwin; and Ramsey, Alan, 4,112,301, Cl. 250-364.000.
Freeman, Daniel L.; Bettencourt, Darryl G.; and Marshall, George E., Jr., to University of California, The Regents of the. Trash-freeing rear cross-conveyor for tomato harvester. 4,111,210, Cl. 130-30.00R.
Freeman, Willie B.: *See—*
Cromer, Charles F.; Yoon, Kue H.; and Freeman, Willie B., 4,112,276, Cl. 200-148.00R.
Freeny, Charles C., Jr., to Information Identification Company, Inc. Method and apparatus for automatically monitoring objects. 4,112,421, Cl. 343-112.00D.
Friedlander, Erich Siegfried, to Associated Electrical Industries Limited. Saturated reactor arrangements. 4,112,403, Cl. 336-12.000.
Friesen, Milo E.: *See—*
Wilson, George E.; Friesen, Milo E.; and Smith, Albert J., 4,112,025, Cl. 261-29.000.
Frisbee, Claude M., to J. I. Case Company. Scraper blade control. 4,111,268, Cl. 172-805.000.
Fross, Arthur E., to Etablissement Gelan. Method for the production of carbon black from liquid or gaseous hydrocarbons. 4,112,060, Cl. 423-450.000.
Frost, Edward G. Comprehensive automatic mobile radio telephone system. 4,112,257, Cl. 179-2.0EB.
Fryer, Rodney Ian; Sternbach, Leo Henryk; and Walser, Armin, to Hoffmann-La Roche Inc. 1,5-Benzodiazepin-4-ones. 4,111,934, Cl. 260-239.30B.
Fryer, Rodney Ian: *See—*
Walser, Armin; and Fryer, Rodney Ian, 4,111,931, Cl. 260-239.30B.
Fuehrer, Werner; Huttel, Richard; Lisfeld, Robert; and Leonhardt, Karl, deceased (by Leonhardt, Herta, administratrix), to Ernst Leitz Wetzlar GmbH. Microscope objective mount. 4,111,530, Cl. 350-252.000.
Fuji Heavy Industries Limited: *See—*
Oya, Hiroo; and Tatejima, Masakazu, 4,110,976, Cl. 60-282.000.
Fuji Photo Film Co., Ltd.: *See—*
Idota, Yoshio; and Shibaoka, Haruo, 4,111,766, Cl. 204-109.000.
Kondo, Toshihiro, 4,112,450, Cl. 354-235.000.
Sato, Masamichi, 4,111,698, Cl. 96-79.000.
Sera, Hidefumi; Shiraishi, Hisashi; and Ishii, Tsumoru, 4,111,926, Cl. 260-117.000.
Fuji Photo Optical Co., Ltd.: *See—*
Kanemaru, Kenji, 4,112,440, Cl. 354-23.00D.
Numata, Saburo; and Okazaki, Shinichiro, 4,112,446, Cl. 354-50.000.
Fujii, Hiroo: *See—*
Okuno, Ryuzo; Fujii, Hiroo; and Toyoda, Keio, 4,111,159, Cl. 122-27.000.
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, to Canon Kabu-

shiki Kaisha. Electrostatic printing master apparatus. 4,111,539, Cl. 355-3.00R.

Fujikura, Yoshiaki: *See—*
Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,111,990, Cl. 260-561.00R.

Fujimori, Shigeaki; Hirata, Shigekazu; and Kitamura, Akira, to Osaka Fuji Kogyo, Ltd. Apparatus for cleaning inner surfaces of moulds. 4,110,863, Cl. 15-104.10C.

Fujimoto, Noriki: *See—*
Inayoshi, Akio; Ito, Toshimichi; Nagatoshi, Kikuo; Nara, Toshihide; Sagata, Shinsuke; Tomari, Hitomi; Fujimoto, Noriki; and Kaji, Hidehiko, 4,111,898, Cl. 260-42.530.

Fujino, Masahiko; Nishimura, Osamu; and Kitada, Chieko, to Takeda Chemical Industries, Ltd. Method for removal of thiol-protecting groups. 4,111,924, Cl. 260-112.50R.

Fujita, Hiro. Method and system for driving liquid crystal display device. 4,110,967, Cl. 58-23.00R.

Fujitsu Fanuc Limited: *See—*
Fukuyama, Hiroomi; and Kaku, Masahiro, 4,112,291, Cl. 235-92.0MP.

Fujiwara, Michio: *See—*
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo; Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, 4,112,260, Cl. 179-18.0FC.

Fukuda, Jun-ichi: *See—*
Takase, Katsuji; Tsuji, Toshimoto; Fukuda, Jun-ichi; and Hiyamori, Yasuchika, 4,111,884, Cl. 260-30.60R.

Fukuda, Kenji: *See—*
Sugimura, Hidehiko; Murakami, Hisashi; Ohtsubo, Toshikatsu; and Fukuda, Kenji, 4,111,786, Cl. 208-8.000.

Fukuda, Makoto: *See—*
Murayama, Naohiro; Fukuda, Makoto; Sakagami, Teruo; Suzuki, Shirou; Kokubu, Yoshikazu; and Enoki, Toshio, 4,111,780, Cl. 204-266.000.

Fukuda, Shozo; Seike, Yajuro; Iizuka, Masafumi; Kasai, Hironao; and Enami, Mamoru, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for collecting effluent oil. 4,111,811, Cl. 210-242.00S.

Fukuichi, Takuro, to Kabushiki Kaisha Daini Seikosha. Digital electronic alarm timepiece. 4,110,969, Cl. 58-57.500.

Fukuoka, Sadao: *See—*
Asano, Teryoshi; Fukuoka, Sadao; and Sawada, Takashi, 4,111,464, Cl. 285-111.000.

Fukuyama, Hiroomi; and Kaku, Masahiro, to Fujitsu Fanuc Limited. Positioning system in a numerically controlled apparatus. 4,112,291, Cl. 235-92.0MP.

Funabashi, Masayuki: *See—*
Sanada, Hisao; Saito, Ritaro; Funabashi, Masayuki; Inada, Kazuyoshi; and Seguchi, Koji, 4,112,053, Cl. 423-239.000.

Funakoshi, Yoshiro; Asogawa, Tatsuo; Satake, Eiichi; Motoyama, Shimesu; Yamada, Shuri; and Kakukawa, Morio, to Takeda Chemical Industries, Ltd. Powder compacting machine. 4,111,626, Cl. 425-203.000.

Funazawa, Masakazu; and Matsumura, Osamu, to Citizen Watch Company Limited. Water-proof watch case. 4,110,970, Cl. 58-90.00R.

Furley, Robert: *See—*
Price, David Watkin; Hodges, Newton John; and Furley, Robert, 4,111,709, Cl. 106-67.000.

Fyfe, Edward, to Elastometal Limited. Expansion joints seal assembly. 4,111,584, Cl. 404-69.000.

Gabbrielli, Ernesto. Extrusion device having intermediate extruder. 4,111,631, Cl. 425-215.000.

Gabrys, Kenneth F., to Pentaject Corporation, The. Mechanism for opening the molding dies of an injection molding machine. 4,111,633, Cl. 425-451.000.

GAF Corporation: *See—*
Burwasser, Herman; and Wyhof, John R., 4,112,172, Cl. 428-215.000.
Gasman, Robert C.; and Charles, John J., 4,111,893, Cl. 260-40.00R.
Ruhf, Truman J., 4,111,878, Cl. 260-29.6ME.
Schneider, Louis; and Graham, David E., 4,112,002, Cl. 260-612.00R.
Terwilliger, Bruce J., 4,112,189, Cl. 428-443.000.

Gagneux, Andre; Heckendorn, Roland; and Meier, Rene, to Ciba-Geigy Corporation. Triazolyl benzophenones. 4,111,950, Cl. 260-308.00R.

Gagnon, John Temple: *See—*
Ford, Wilson; and Gagnon, John Temple, 4,111,026, Cl. 72-289.000.

Galate, Joseph W.: *See—*
Jahns, Hans O.; Galate, Joseph W.; and Wheeler, John A., Jr., 4,111,258, Cl. 165-40.000.

Gale, Richard A.; and Kahl, Donald L. Rotary piston mechanism. 4,111,617, Cl. 418-61.00B.

Galinke, Joachim: *See—*
Abendroth, Henning; Galinke, Joachim; and Wiemers, Norbert, 4,111,880, Cl. 260-29.6MP.

Gall, Richard C.: *See—*
Guif, Stanley E.; Nimmer, Terry L.; Weigt, Donald A.; Wolenec, Glenn; and Gall, Richard C., 4,112,464, Cl. 358-122.000.

Galli, Paolo: *See—*
Foschini, Giorgio; Fiscelli, Nicolino; and Galli, Paolo, 4,111,835, Cl. 252-429.00C.

Ganellin, Charon Robin: *See—*
Durant, Graham John; and Ganellin, Charon Robin, 4,112,104, Cl. 424-270.000.

Gani, Venkappa Laxmappa; and Montegari, Frank Alfred, to International Business Machines Corporation. Logical current switch. 4,112,314, Cl. 307-215.000.

Gardiner, William L.: *See—*
Devine, Donald R.; and Gardiner, William L., 4,111,280, Cl. 182-8.000.

Gardner, James A. Torso exerciser. 4,111,417, Cl. 272-136.000.

Garlinghouse, Leslie H. Mixer for liquid charges. 4,112,518, Cl. 366-219.000.

Garner, Joseph L.: *See—*
Gunsher, Jeffrey A.; Garner, Joseph L.; and Miller, Conrad O. M., 4,112,209, Cl. 526-65.000.

Garner, Lynn Thomas, to Lowe Paper Company; and Bolivia Lumber Company. Method for producing molded articles. 4,112,038, Cl. 264-138.000.

Garnys, Vytenis Peter, to Unisearch Limited. Multi-sample transporting and heating apparatus for use in atomic absorption spectrometry. 4,111,553, Cl. 356-36.000.

Garrison, James A., to Deepwater Chemical Co. Process for making halogen salts. 4,111,991, Cl. 260-583.00P.

Garwood, William E.: *See—*
Caesar, Philip D.; Garwood, William E.; Krudewig, William F.; and Wise, John J., 4,111,792, Cl. 208-79.000.

Gasman, Robert C.; and Charles, John J., to GAF Corporation. Polybutylene terephthalate molding resin. 4,111,893, Cl. 260-40.00R.

Gates Rubber Company, The: *See—*
Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, 4,112,202, Cl. 429-94.000.

Gatti, Arno: *See—*
Noone, Michael J.; and Gatti, Arno, 4,111,572, Cl. 403-28.000.

Gault, Roger T.: *See—*
Fenton, Alvin P.; Gault, Roger T.; and Bernauer, Lawrence J., 4,111,176, Cl. 123-198.0DB.

Gautier, Christian Jean; Marti, Bernard; Mauduit, Michel Robert; Louineau, Andre Jean-Francois; and Schwartz nee Luneau, Christiane, to Etablissement Public dit "Telediffusion de France". Television picture photographic film recording system. 4,112,459, Cl. 358-6.000.

Gaylord, John A., to H. Koch & Sons, Inc., a division of Global Systems, a Gulf & Western Company. Retractable pin disconnect. 4,110,874, Cl. 24-230.0AS.

Gdulla, Manfred: *See—*
Warncke, Ernst; and Gdulla, Manfred, 4,111,197, Cl. 128-142.400.

Geithman, Glenn Allen; and Woodmansee, Wayne Earl, to Boeing Company, The. Audible bond tester. 4,111,053, Cl. 73-588.000.

Gelman Instrument Company: *See—*
Boomus, Mary; Sobin, Bernard; and Vincent, Monty E., 4,111,807, Cl. 210-152.000.

Gelnett, Leland E., to Rockwell International Corporation. Control line relief valve. 4,111,223, Cl. 137-115.000.

Gelotte, Karl O.; Zalay, Andrew W.; and Bell, Malcolm R., to Sterling Drug Inc. Preparation of 3-(pyridinyl)-2-cyclohexen-1-ones. 4,111,946, Cl. 260-297.00R.

General Atomic Company: *See—*
Arya, Satya Prakash; Ballard, Albert Stevens; and Foster, Stephen James, 4,111,335, Cl. 222-57.000.
Pieren, William R.; and Stetson, Robert F., 4,112,288, Cl. 219-121.00P.

General Cable Corporation: *See—*
Bahder, George; Eager, George S., Jr.; and Suarez, Rafael, 4,112,354, Cl. 324-54.000.

General Dynamics Corporation: *See—*
Babcock, Robert A.; Glasfeld, Rolf D.; and Holt, Luther E., 4,111,146, Cl. 114-74.00A.
Lasker, George, 4,111,097, Cl. 89-36.00A.

General Electric Company: *See—*
Blair, Ronald A.; Nickstadt, Gerhard A.; and Imbrogno, Gaetano O., 4,111,069, Cl. 74-606.00R.
Bluestein, Ben A., 4,111,973, Cl. 260-448.20E.
Brandt, Richard Thornton, 4,112,303, Cl. 250-445.00T.
Dvorak, Antonin J., 4,111,562, Cl. 356-244.000.
Hicks, William R.; and Woodard, Richard S., 4,111,372, Cl. 241-37.500.
Hyer, Donald R., 4,112,359, Cl. 324-78.00E.
Kydd, Paul H., 4,111,604, Cl. 416-97.00R.
Lipo, Thomas A., 4,112,339, Cl. 318-227.000.
Mark, Victor; and Wilson, Phillip Steven, 4,111,883, Cl. 260-30.60R.
Mark, Victor, 4,111,977, Cl. 260-45.95R.
Nash, James L.; Polich, Stanley J.; and Carrico, Philip H., 4,112,034, Cl. 264-95.000.
Noone, Michael J.; and Gatti, Arno, 4,111,572, Cl. 403-28.000.
Stitt, Thomas Detlor; and Williamson, Dennis Francis, 4,112,475, Cl. 361-33.000.
Waugh, Richard A., 4,111,011, Cl. 68-17.00R.
Wilson, S. R.; and Jones, D. B., 4,112,474, Cl. 361-15.000.

General Electric Company Limited, The: *See—*
Leworthy, John Harwood, 4,112,284, Cl. 200-340.000.

General Mills Fun Group, Inc.: *See—*
Brass, Robert L., 4,110,932, Cl. 46-29.000.

General Motors Corporation: *See—*
Abu-Isa, Ismat A., 4,111,885, Cl. 260-31.80R.
Arakelian, Edward M.; and Maugans, Terrance W., 4,112,273, Cl. 200-67.00D.
Arnold, Willi; Pflughaupt, Rolf; and Felzer, Bertold, 4,111,456, Cl. 280-692.000.
Casey, Gary L., 4,111,178, Cl. 123-32.0SA.

Chana, Howard E., 4,111,073, Cl. 74-865.000.
Davison, Ellard D., Jr., 4,111,104, Cl. 92-127.000.
Fischer, Earl R.; and Gural, John A., 4,111,099, Cl. 91-173.000.
Gordon, Ralph A.; Mathues, Thomas P.; and Parker, Donald L., 4,110,985, Cl. 60-548.000.
Harmon, Kenneth B.; Koenig, Richard J.; and Lentz, Carl A., 4,111,072, Cl. 74-864.000.
Joseph, Bernard W., 4,111,526, Cl. 350-162.0SF.
LaBoda, Mitchell A., 4,111,761, Cl. 204-26.000.
Livesay, J. D., 4,111,005, Cl. 62-503.000.
Loos, John H., 4,111,001, Cl. 62-427.000.
Magyar, Joseph J., 4,111,459, Cl. 280-744.000.
Mutzner, John E.; and Ford, Gary P., 4,111,237, Cl. 138-125.000.
Sharpe, Cecil H., 4,111,369, Cl. 239-400.000.
Sherwin, Walter M., 4,112,477, Cl. 361-155.000.
Stimson, Grant L.; and Kesten, Patrick N., 4,112,330, Cl. 315-46.000.
Vennemeyer, Alfred C.; and Ernst, Richard A., 4,111,031, Cl. 72-359.000.
West, Gene A.; and Hamren, Glen C., 4,111,035, Cl. 73-35.000.
Zens, John F., 4,110,934, Cl. 49-218.000.

General Power Corp.: *See—*
Pigman, Chester Joseph; and Pewton, James Arthur, Sr., 4,112,274, Cl. 200-146.00R.

Gentry, Stephen John: *See—*
Firth, Jack Graham; Gentry, Stephen John; and Jones, Alan, 4,111,658, Cl. 23-232.00E.

Gerber, Richard: *See—*
Ehrmann, Karl; Gerber, Richard; and Doderer, Klaus, 4,111,168, Cl. 123-117.00A.

Gergen, William P.; and Davison, Sol, to Shell Oil Company. Multicomponent halogenated thermoplastic-block copolymer-polymer blends. 4,111,894, Cl. 260-40.00R.

Gergen, William P.; and Davison, Sol, to Shell Oil Company. Multicomponent polycarbonate-block copolymer-polymer blends. 4,111,895, Cl. 260-42.180.

Gergen, William P.; and Davison, Sol, to Shell Oil Company. Multicomponent nitrile resin-block copolymer-polymer blends. 4,111,896, Cl. 260-42.180.

Gerresheimer Glas Aktiengesellschaft: *See—*
Mainz, Franz, 4,110,950, Cl. 52-518.000.

Geschwender, Robert C., to Bell Fibre Products Corporation. Mastic composition and composite structural panels formed therefrom. 4,111,862, Cl. 521-55.000.

Getson, John C.; and Johnson, Wendell L., to SWS Silicones Corporation. Curable organopolysiloxane compositions containing titanium esters. 4,111,890, Cl. 260-37.0SB.

Gewerkschaft Eisenhutte Westfalia: *See—*
Beckmann, Klaus; and Linke, Horst, 4,111,489, Cl. 299-34.000.

Ghestem, Gerard, to Fives-Cail Babcock. Manufacture of cement. 4,110,915, Cl. 34-20.000.

Gibson, Harry S., Jr.; and Trevillion, Charlie Gene, to Lockheed Corporation. Quality and fit measuring apparatus for fasteners and their holes. 4,112,355, Cl. 324-57.00R.

Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, to Bayer Aktiengesellschaft. Polyparabanic acid derivatives. 4,111,918, Cl. 528-73.000.

Gillette Company, The: *See—*
Lindemann, Martin K. O.; and Lazar, Harvey A., 4,111,653, Cl. 8-161.000.

Gillis, Alva Knox; Otten, Thomas Harvey; and Bardos, Andrew Miklos, to Harris Corporation. Recording and reading synthetic holograms. 4,111,519, Cl. 350-3.660.

Gilmer, Donald G.: *See—*
Bradley, Bruce R.; Eckelman, Larry D.; and Gilmer, Donald G., 4,110,965, Cl. 57-157.0TS.

Gilmore, Oscar Patton. Static mixer. 4,112,520, Cl. 366-337.000.

Giombini, Giuseppe, to Colgate-Palmolive Company. Mixing apparatus. 4,112,517, Cl. 366-102.000.

Girling Limited: *See—*
Honick, Hermann Hans, 4,111,285, Cl. 188-73.600.

Girt, Keith Harry: *See—*
Robinson, Frank; Girt, Keith Harry; and Whatmough, Nigel Stephen, 4,111,009, Cl. 66-189.000.

Givaudan Corporation: *See—*
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Glasfeld, Rolf D.: *See—*
Babcock, Robert A.; Glasfeld, Rolf D.; and Holt, Luther E., 4,111,146, Cl. 114-74.00A.

Glassman, Donald: *See—*
Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,111,759, Cl. 203-7.000.

Glaswerk Schott & Gen.: *See—*
Schroder, Hubert; and Klein, Werner, 4,112,142, Cl. 427-166.000.

Gleason, John Gerald, to SmithKline Corporation. Intermediates for preparing substituted phenylglycylcephalosporins. 4,111,981, Cl. 562-444.000.

Glenn, Eldridge Myles: *See—*
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Globe-Union Inc.: *See—*
Bantz, Paul Edward; and Mayer, Robert William, 4,111,256, Cl. 164-335.000.

Glossop, Mark B.; Buckmaster, Adrian C.; Cook, Neville G. W.; Hojem, Justin P. M.; Joughin, Noel C.; Taylor, Richard F.; Cramp, Robert W.; and Hatcher, John L. Rock conveyors. 4,111,296, Cl. 198-519.000.

Godard, Bruno, to Compagnie Generale d'Electricite S.A. Gas laser generator. 4,112,391, Cl. 331-94.5PE.

Goddard, Steven Jerome, to Du Pont de Nemours, E. I., and Company. Cycloalkanapyrazole-3-carbonitrile herbicides. 4,111,681, Cl. 71-92.000.

Goddijn, Bernardus Henricus Antonius, to U.S. Philips Corporation. Stepping motor with energizing circuit. 4,112,345, Cl. 318-696.000.

Godlewski, Robert Everett, to Union Carbide Corporation. Method of molding polyurethanes having mold release properties. 4,111,861, Cl. 521-123.000.

Godtland, Magne. Jet engine having combustion chamber within compressor. 4,110,975, Cl. 60-262.000.

Goeke, Alfons, to Th. Kieserling & Albrecht. Multiple cutting plate for peeling machines. 4,111,589, Cl. 407-114.000.

Goetz, Gerald F.: *See—*
Young, John H.; and Goetz, Gerald F., 4,110,972, Cl. 60-230.000.

Goffinet, Pierre: *See—*
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,111,260, Cl. 165-104.00S.

Gohlisch, Hans-Joachim, to Paul Troester Maschinenfabrik. Process and apparatus for producing rubber hose with textile thread reinforcing. 4,112,031, Cl. 264-26.000.

Goldberg, Leon, to Weinberger, Lawrence P., a part interest. Method and apparatus for reducing pollutant emissions while increasing efficiency of combustion. 4,111,636, Cl. 431-2.000.

Goldstein, Richard M.: *See—*
United States of America, National Aeronautics and Space Administration; Layland, James W.; Martin, Warren L.; Zygielbaum, Arthur I.; Goldstein, Richard M.; and Hubbard, William P., 4,112,497, Cl. 364-728.000.

Golladay, James D.; and Abler, Norman C., to Bunker Ramo Corporation. Apparatus for producing patterned deep pile circular knitted fabrics. 4,111,006, Cl. 66-9.00B.

Gomez, Magdalena Usategui: *See—*
Farrenkopf, Bruce Charles; and Gomez, Magdalena Usategui, 4,112,064, Cl. 424-1.000.

Gonnai, Tohru; and Yamashita, Chikao, to Brother Kogyo Kabushiki Kaisha. Thread tensioning device for a sewing machine. 4,111,140, Cl. 112-254.000.

Gonser, Donald I., to Dentsply Research & Development Corp. Rapid pulse ultraviolet light apparatus. 4,112,335, Cl. 315-241.00R.

Goodrich, Edward Verle. Rock holding device. 4,111,180, Cl. 125-35.000.

Goodwin, Elwood. Golf club swing training device. 4,111,426, Cl. 273-186.00C.

Goodyear Tire & Rubber Company, The: *See—*
Bauer, John R., 4,111,250, Cl. 152-187.000.
Creekmore, Mark D.; and Watts, William A., 4,112,158, Cl. 428-35.000.
Nowak, Edward Norbert; Wideman, Lawson Gibson; and Hutchings, David Alan, 4,112,243, Cl. 568-768.000.
Nowak, Edward Norbert; and Hollingshead, William Shepherd, 4,112,244, Cl. 568-768.000.
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Goralski, Christian T.: *See—*
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Gordon, Ralph A.; Mathues, Thomas P.; and Parker, Donald L., to General Motors Corporation. Dual power brake booster. 4,110,985, Cl. 60-548.000.

Gordon, Rob Roy, Jr.: *See—*
Weiss, William Robert; Cooksey, James Judson; and Gordon, Rob Roy, Jr., 4,110,876, Cl. 28-271.000.

Gore, Christopher Robert; and Arm, Geoffrey George, to Imperial Chemical Industries Limited. Moulding compositions. 4,112,023, Cl. 260-901.000.

Gorkiewicz, Mitchell F. Tilting hanger apparatus. 4,111,506, Cl. 312-211.000.

Gorman, Walter T.: *See—*
Murray, James T.; and Gorman, Walter T., 4,110,947, Cl. 52-249.000.

Goto, Eiichi; Soma, Takashi; and Idesawa, Masanori, to Rikagaku Kenkyusho. Method of projecting a beam of charged particles. 4,112,305, Cl. 250-492.00R.

Goto, Norimasa: *See—*
Yoshida, Eiichi; Nakao, Hideo; Goto, Norimasa; Sugiyama, Toul; and Kashiwaya, Sadao, 4,112,141, Cl. 427-142.000.

Gould Inc.: *See—*
Fedor, Robert J., 4,111,849, Cl. 252-474.000.

Gould, Peter Brian, to Advance Industries Limited. Moulded plastic clip device. 4,110,872, Cl. 24-67.110.

Graham, David E.: *See—*
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Graham, Louis Atkins: *See—*
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Grams, Harold: *See—*
Karayannis, Nicholas M.; and Grams, Harold, 4,111,836, Cl. 252-429.00B.

Graphic Controls Corporation: *See—*
Lawton, William R., 4,111,703, Cl. 106-21.000.

Gratacos, Jaime; Perrolet, Christian; and Mousteou, Roger, to Societe

Nationale Elf Aquitaine (Production). Testing for corrosion of the internal wall of a metal chamber. 4,111,040, Cl. 73-105.000.
Graves, Bernard Albert; and Mockett, John Edward, to Masson Scott Thrissell Engineering Ltd. Sheet stacking apparatus. 4,111,411, Cl. 271-199.000.
Gray, Charles Alexander, to BJ-HUGHES Inc. Pipe cap. 4,111,235, Cl. 138-109.000.
Great Northern Nekoosa Corporation: *See—*
Levensalor, George W., 4,111,461, Cl. 282-27.500.
Greber, Gerd: *See—*
Darms, Roland; Kvita, Vratislav; and Greber, Gerd, 4,111,771, Cl. 204-159.220.
Green, George Edward; Stark, Bernard Peter; and Waterhouse, John Sidney, to Ciba-Geigy Corporation. Photopolymerizable ketones. 4,111,907, Cl. 260-830.00R.
Green, Melvin E.; Derrickson, Charles H.; and Lala, Louis A., to American Screen Printing Equipment Co. Multi-purpose screen printing machine. 4,111,118, Cl. 101-123.000.
Green, Robin John: *See—*
Leigh, Arthur George; and Green, Robin John, 4,111,826, Cl. 252-89.00R.
Greenham, Joseph G.; and Moore, Sanford A. B., to Devro, Inc. Core exchanging stuffing horn. 4,110,871, Cl. 17-33.000.
Greenhow, Geoffrey; and Greenhow, Peter N. Pouring spout for threaded neck containers. 4,111,340, Cl. 222-527.000.
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Greenhow, Geoffrey; and Greenhow, Peter N., 4,111,340, Cl. 222-527.000.
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Greiner, Gunter; and Murmann, Gunter, to Cherry Electrical Products Corp. Push button switch. 4,112,278, Cl. 200-156.000.
Gretag Aktiengesellschaft: *See—*
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Griffith, George L.: *See—*
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Grigorenko, Georgy Mikhailovich: *See—*
Lakomsky, Viktor Iosifovich; Sheiko, Ivan Vasilievich; Grigorenko, Georgy Mikhailovich; Torkhov, Gennady Fedorovich; Trigub, Vladimir Kirillovich; Korotkov, Albert Nikitovich; Kurganov, Viktor Mikhailovich; Moshkevich, Evgeny Isaevich; Pakhomov, Alexei Ivanovich; and Verkhovtsev, Emil Vasilievich, 4,112,246, Cl. 13-2.00P.
Grimm, William G.: *See—*
Pott, Ronald W.; and Grimm, William G., 4,112,195, Cl. 428-542.000.
Grisar, Ulrich; and Berstermann, Wilhelm, to Klockner-Werke AG. Control system for alloy tester. 4,111,556, Cl. 356-86.000.
Groff, Roy E.: *See—*
Wade, Jackie F.; Peyton, John E.; Klitzky, Bruce R.; and Groff, Roy E., 4,111,762, Cl. 204-33.000.
Gross, Chris, to United States of America, National Aeronautics and Space Administration. Electrically scanned pressure sensor module with in situ calibration capability. 4,111,058, Cl. 73-714.000.
Grossi, Carlo; and Taffelli, Aldo C., to Worthington Pump, Inc. Centrifugal pump with centripetal inducer. 4,111,597, Cl. 415-143.000.
Grow Chemical Corp.: *See—*
Tsou, Ivan H., 4,112,214, Cl. 528-494.000.
Gruffaz, Max; and Locatelli, Jean-Louis, to Rhone-Poulenc Industries. Thermosetting composition from a bis-maleimide and N-vinyl pyrrolidone. 4,111,919, Cl. 526-264.000.
Grumman Aerospace Corporation: *See—*
Markow, Edward G., 4,111,249, Cl. 152-330.0RF.
Grunfeld, Yona: *See—*
Ashani, Yacov; Amitai, Gavriel; Grunfeld, Yona; Kalir, Asher; and Cohen, Sasson, 4,112,082, Cl. 424-209.000.
Grunwald, Lynn O.: *See—*
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Gschwendtner, Joerg: *See—*
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GTE Automatic Electric Laboratories Incorporated: *See—*
Lender, Adam, 4,112,263, Cl. 179-175.31R.
GTE Sylvania Incorporated: *See—*
Bracht, Donald L.; and Swank, Harry R., 4,110,877, Cl. 29-25.130.
Chenot, Charles Frederic; Mathers, James Evan; and Shaffer, Francis Nathan, 4,112,194, Cl. 428-539.000.
Neuber, Ralph E.; and Rehkopf, Charles H., 4,111,507, Cl. 316-27.000.
Steigelman, James Q., 4,112,180, Cl. 428-332.000.
Wolfe, Robert W.; and Messier, Russell F., 4,112,328, Cl. 313-486.000.
Guerpillon, Henri: *See—*
Masotti, Robert; Biola, Georges; and Guerpillon, Henri, 4,111,662, Cl. 422-231.000.
Guif, Stanley E.; Nimmer, Terry L.; Weigt, Donald A.; Wolenec, Glenn; and Gall, Richard C., to Oak Industries Inc. Subscription TV decoder logic system. 4,112,464, Cl. 358-122.000.
Guillot, Edmond P.: *See—*
Benoit, Roland A.; and Guillot, Edmond P., 4,110,856, Cl. 5-68.000.
Guinosso, Charles J.: *See—*
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,112,094, Cl. 424-250.000.
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,112,101, Cl. 424-263.000.
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,112,106, Cl. 424-270.000.
Gulf Oil Canada Limited: *See—*
Porteous, Kenneth; Falkenberg, Leigh; and Lane, Stephen, 4,111,789, Cl. 208-11.0LE.
Gulf Research & Development Co.: *See—*
Schulz, Johann G. D.; Selwitz, Charles M.; and Onopchenko, Anatoli, 4,111,824, Cl. 252-63.000.
Schulz, Johann G. D.; Selwitz, Charles M.; and Onopchenko, Anatoli, 4,111,825, Cl. 252-63.000.
Yanik, Stephen J.; Montagna, Angelo A.; and Frayer, James A., 4,111,796, Cl. 208-216.000.
Gulf & Western Manufacturing Company: *See—*
Rolnick, Edward M., 4,111,591, Cl. 408-117.000.
Gundlach, Arnold; and Eder, Hans, to Franz Kuhlmann KG. Column drawing table. 4,111,389, Cl. 248-162.000.
Gunnarsson, Arne Nils, to FMC Corporation. Sweeper hood with transverse air duct and broom compartments. 4,110,864, Cl. 15-340.000.
Gunsher, Jeffrey A.; Garner, Joseph L.; and Miller, Conrad O. M., to Dow Chemical Company, The. Process for making polystyrene. 4,112,209, Cl. 526-65.000.
Gupta, Ashis S., to Coca-Cola Company, The. Spray drying of orange juice. 4,112,130, Cl. 426-471.000.
Gupta, Tapan K.: *See—*
Ho, Shih M.; and Gupta, Tapan K., 4,111,852, Cl. 252-518.000.
Hower, Philip L.; Carlson, William G.; and Gupta, Tapan K., 4,112,362, Cl. 324-158.00R.
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Fischer, Earl R.; and Gural, John A., 4,111,099, Cl. 91-173.000.
Guthrie, James F.; and Zimmerman, Richard E., to Flow Technology, Inc. Turbine flowmeter. 4,111,043, Cl. 73-197.000.
Gutman, Arnold David, to Stauffer Chemical Company. N-(aminoalkylene thiomethyl)-N'-(aryl) urea herbicides. 4,111,682, Cl. 71-98.000.
Gwozdz, Joseph W., to McKinney Manufacturing Company. Retractable door stop for bidirectional swinging door. 4,110,867, Cl. 16-82.000.
H. F. Henderson Industries: *See—*
Ward, William H.; Henderson, Henry F., Jr.; and Kardux, Kenneth H., 4,111,336, Cl. 222-58.000.
H. K. Porter Company, Inc.: *See—*
Chung, Asuncion, 4,112,268, Cl. 200-48.0SB.
H. Koch & Sons, Inc., a division of Global Systems, a Gulf & Western Company: *See—*
Gaylord, John A., 4,110,874, Cl. 24-230.0AS.
H. Waterbury & Sons Company: *See—*
Limbach, Paul; and Socha, Paul, 4,111,634, Cl. 425-505.000.
Haag, Werner O.; and Whitehurst, Darrell Duayne, to Mobil Oil Corporation. Insoluble resin-metal compound complex prepared by contacting weak base ion exchange resin with solution of metal-ligand. 4,111,856, Cl. 521-30.000.
Haas, Georges; and Rossi, Alberto, to Ciba-Geigy Corporation. Cyclo aliphatic-phenylene-carbonyl-pyridines. 4,112,099, Cl. 424-263.000.
Habel, Erich: *See—*
Sick, Hans-Hermann; and Habel, Erich, 4,111,441, Cl. 277-183.000.
Haberli, Roland: *See—*
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Haberthier, Wilbert L. Solar heating unit. 4,111,183, Cl. 126-270.000.
Hadley, Chris L.: *See—*
Roch, Gerald V.; and Hadley, Chris L., 4,112,493, Cl. 364-476.000.
Haeflich, Jack; and Christman, Peter C., to Energy Services Inc. Water injection system for industrial gas turbine engine. 4,110,973, Cl. 60-39.050.
Haggblom, Per, to Edsbyns Industri AB. Process and an apparatus for killing trees or woody plants. 4,110,933, Cl. 47-57.500.
Haglund, John Helge, to Kanthal Corporation, The. Metal casting method. 4,111,254, Cl. 164-138.000.
Hahn, Norbert: *See—*
Neff, Robert O.; Grunwald, Lynn O.; Potter, Roderick B.; and Hahn, Norbert, 4,110,860, Cl. 14-71.700.
Haibeck, Kenneth. Device for supporting a paraplegic in an upright position. 4,111,445, Cl. 280-79.300.
Hall, Daniel N.: *See—*
Mueller, Wolfgang H.; Oswald, Alexis A.; and Hall, Daniel N., 4,112,024, Cl. 260-956.000.
Hall, Freeman F., Jr.; and Redmann, Jerome J., to International Telephone and Telegraph Corporation. Infrared electronic countermeasures. 4,112,300, Cl. 250-330.000.
Hall & Myers: *See—*
Rabinow, Jacob, 4,111,019, Cl. 70-358.000.
Hallberg, John Emil; and Taylor, Otis Max, to TMC, Inc. Industrial fuel blender and fuel blending method. 4,111,219, Cl. 137-3.000.
Halliburton Company: *See—*
Oliver, Owen Norman, 4,111,261, Cl. 166-86.000.
Ham, George E.: *See—*
Baggett, Joseph M.; and Ham, George E., 4,111,899, Cl. 260-45.80R.
Hambleton, Thomas P., to International Paper Company. Six-cell container divider. 4,111,350, Cl. 229-15.000.
Hamelink, William B., to Honeywell Inc. Condition control system utilizing digital logic. 4,112,318, Cl. 307-308.000.
Hamers, Adolf: *See—*
Thiem, Karl-Werner; Hamers, Adolf; and Heinen, Josef, 4,112,005, Cl. 260-645.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand-held labeler. 4,111,735, Cl. 156-384.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Apparatus for printing and applying pressure sensitive labels. 4,111,736, Cl. 156-384.000.

Hammann, Ingeborg: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,112,081, Cl. 424-200.000.

Hammen, Ingeborg: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammen, Ingeborg; and Homeyer, Bernhard, 4,112,080, Cl. 424-200.000.

Hammond, Graeme L.: *See*—
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Kirby, Robert Willis, 4,111,137, Cl. 112-121.150.

Hamren, Glen C.: *See*—
West, Gene A.; and Hamren, Glen C., 4,111,035, Cl. 73-35.000.

Hancock, Charles Lee. Bumper hitch for towing motorcycles. 4,111,449, Cl. 280-402.000.

Hanifin, John William, Jr.: *See*—
Allen, George Rodger, Jr.; Hanifin, John William, Jr.; Moran, Daniel Bryan; and Albright, Jay Donald, 4,112,095, Cl. 424-250.000.

Hanley, Don N. Macrame rack apparatus. 4,111,471, Cl. 289-18.000.

Hanmura, Hisao: *See*—
Kinoshita, Hiroshi; Iwasaka, Tatsuo; and Hanmura, Hisao, 4,112,419, Cl. 340-560.000.

Hannes, George John; Rohweder, Theodore Richard; Dreikorn, Hans Wendell; and Shepherd, Philip Bickford, to Johns-Manville Corporation. Fibrous mat especially suitable for roofing products. 4,112,174, Cl. 428-220.000.

Hansen, William L.: *See*—
Salditt, Ferdinand; and Hansen, William L., 4,112,177, Cl. 428-304.000.

Hanson, Bruce L.: *See*—
Wolvek, Sidney; Hanson, Bruce L.; and Bregman, David, 4,111,209, Cl. 128-400.000.

Hanson, Donald O., to Phillips Petroleum Company. Production of carbon monoxide from carbonaceous material and zinc oxide. 4,112,058, Cl. 423-415.00A.

Hanson, Douglas R. Dough piece imprinter and controls therefore. 4,111,624, Cl. 425-135.000.

Harendza-Harinxma, Alfred J. Process for treating municipal solid waste and raw sewage sludge. 4,111,800, Cl. 210-10.000.

Harmening, Denise M., to Research Corporation. Blood preservation system. 4,112,070, Cl. 424-101.000.

Harmon, Kenneth B.; Koenig, Richard J.; and Lentz, Carl A., to General Motors Corporation. Transmission with automatic and manual control modes. 4,111,072, Cl. 74-864.000.

Harmon, Paul E.: *See*—
Tetro, Richard S.; and Harmon, Paul E., 4,111,377, Cl. 242-56.00R.

Harmsen, Nils, to W. C. Heraeus GmbH. Electrical contacts with gold alloy. 4,111,690, Cl. 75-165.000.

Harris Corporation: *See*—
Gillis, Alva Knox; Otten, Thomas Harvey; and Bardos, Andrew Miklos, 4,111,519, Cl. 350-3.660.
Mendenhall, Geoffrey N., 4,112,259, Cl. 179-15.0BT.
Rohrbach, Peter H., 4,111,153, Cl. 118-7.000.

Harris, Harry Wayne: *See*—
Schaeffer, James Robert; Snoke, Roy Eugene; and Harris, Harry Wayne, 4,111,838, Cl. 252-430.000.

Harris, Marion K. Steam engine in which the cylinder inlet valves are actuated by the operation of the power conversion means. 4,111,102, Cl. 91-480.000.

Harris, Monty E.: *See*—
Winn, Fred M., Jr.; and Harris, Monty E., 4,111,334, Cl. 221-75.000.

Hart, Russell Frank: *See*—
Muhs, Donald Paul; and Hart, Russell Frank, 4,112,413, Cl. 340-27.00R.

Hartmann, Joseph L.: *See*—
Ricciardi, Ronald J.; Ferrara, Angelo; Hartmann, Joseph L.; and Lauterbach, Gary R., 4,111,272, Cl. 177-50.000.

Harvey, Donald Malcolm, to Eastman Kodak Company. Method and apparatus for treating elements of photographic film. 4,112,454, Cl. 354-330.000.

Hasegawa, Akiji; Yasuda, Isao; and Kobayashi, Kazuhiko, to Hitachi, Ltd. Control method for a remote supervisory control system. 4,112,416, Cl. 340-147.00R.

Hasegawa, Gary K.: *See*—
Mascia, Carmen T.; and Hasegawa, Gary K., 4,111,298, Cl. 206-151.000.

Hasenwinkle, Earl Dean, to Weyerhaeuser Company. Log cutting and rejoining process for lumber manufacture. 4,111,247, Cl. 144-316.000.

Hashimoto, Hideo. Catapult toy. 4,111,179, Cl. 124-7.000.

Hassell, David Allen, to Cornelius Company, The. Adjustment limiter in a compressed gas pressure regulator. 4,111,222, Cl. 137-69.000.

Hastings, Paul F. Handlebar latching mechanism for lawn and yard implement. 4,110,869, Cl. 16-111.00A.

Hastings, Russell, Jr., to Clark Equipment Company. Regulator valve. 4,111,283, Cl. 187-9.00R.

Hatanaka, Takefumi, to International Patent Transactions Company Limited. Tool holder. 4,111,587, Cl. 407-91.000.

Hatcher, John L.: *See*—
Glossop, Mark B.; Buckmaster, Adrian C.; Cook, Neville G. W.; Hojem, Justin P. M.; Joughin, Noel C.; Taylor, Richard F.; Cramp, Robert W.; and Hatcher, John L., 4,111,296, Cl. 198-519.000.

Haugen, Donald. Animal litter container. 4,111,157, Cl. 119-1.000.

Hauke, Francis Edward; McCully, Everette Ray; McElroy, Robert Marion, Jr.; Stevenson, Peter Alan; Vogel, Stephen Martin; and Woods, John Walton, to International Business Machines Corporation. Longitudinal scan, cam shaped, turntable rotor for magnetic recording. 4,112,472, Cl. 360-102.000.

Hautaniemi, B. Wendell: *See*—
Jorgensen, Hans G.; and Hautaniemi, B. Wendell, 4,111,054, Cl. 73-611.000.

Havel, Josef; Vobornik, Vaclav; Ripka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Planansky, Agaton; and Rehackova, Bozena, to Vyzkumny ustav bavlnarsky. Spinning unit of an open-end spinning machine. 4,110,961, Cl. 57-58.890.

Hayakawa, Takeshi: *See*—
Asakura, Toshiyuki; Itoga, Masaaki; Hayakawa, Takeshi; and Tanimura, Masamitsu, 4,112,187, Cl. 428-474.000.

Hayashi, Kiyozumi; and Sato, Kenji, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Nuclear fuel rod with stress relieving device. 4,111,748, Cl. 176-68.000.

Hayashi, Yoshimasa: *See*—
Aoyama, Syuniti; Hayashi, Yoshimasa; and Nakajima, Yasuo, 4,111,165, Cl. 123-90.150.

Hayes, Thomas H., to Ethyl Corporation. Finger operated spray pump. 4,111,367, Cl. 239-333.000.

Heald, Raymond A., to Signetics Corporation. Four transistor static bipolar memory cell using merged transistors. 4,112,511, Cl. 365-188.000.

Heaps, Joseph D.; and Tufte, Obert N., to Honeywell Inc. Method for dip-coating ceramic with molten silicon. 4,112,135, Cl. 427-11.000.

Hechenbleikner, Ingenuin, to Borg-Warner Corporation. Hindered five-membered nitrogen rings as polyolefin stabilizers. 4,111,901, Cl. 260-45.80N.

Heckendorn, Roland: *See*—
Gagneux, Andre; Heckendorn, Roland; and Meier, Rene, 4,111,950, Cl. 260-308.00R.

Heerema, Pieter Schelte, to Panama Overseas Shipping Corporation Inc. Apparatus for driving piles. 4,110,993, Cl. 405-228.000.

Heger, Adolf; Mockel, Gerrit; Passler, Helmar; Pohlink, Jochen; and Wunsch, Werner, to VEB Plauener Gardine. Method of making a pattern-dyed, pattern-textures, or lace like textile or foil. 4,112,136, Cl. 427-36.000.

Heider, Wolfgang: *See*—
Pracher, Ernst; Schrotter, Wolfgang Adalbert; and Heider, Wolfgang, 4,112,399, Cl. 335-106.000.

Heikel, Henrik R.; and Leddy, James J., to Dow Chemical Company, The. Electrode coating process. 4,112,140, Cl. 427-126.000.

Heim Universal Corporation, The: *See*—
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Heimbigner, Gary L.; and Booher, Robert K., to Rockwell International Corporation. Data latch. 4,112,296, Cl. 307-279.000.

Heinen, Josef: *See*—
Thiem, Karl-Werner; Hamers, Adolf; and Heinen, Josef, 4,112,005, Cl. 260-645.000.

Heinrich, Theodore M.: *See*—
Oates, Robert M.; and Heinrich, Theodore M., 4,112,287, Cl. 219-10.49R.

Heinz, Henry, Jr., to Union Carbide Corporation. Galvanic cell having a primary radial seal and a secondary resealable vent closure. 4,112,200, Cl. 429-54.000.

Heisterkamp, Wilhelm: *See*—
Lagemann, Gunther; and Heisterkamp, Wilhelm, 4,111,756, Cl. 201-41.000.

Heizler, Fritz: *See*—
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Heller, Alwin: *See*—
Sextro, Gunter; Burg, Karlheinz; Schlaf, Helmut; Sabel, Hans-Dieter; and Heller, Alwin, 4,111,912, Cl. 528-45.000.

Henderson, Henry F., Jr.: *See*—
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Hengartner, Urs Oskar, to Hoffmann-La Roche Inc. Process for L-3,4-dehydroproline. 4,111,951, Cl. 260-326.200.

Hengl, Helmut: *See*—
Ederer, Georg; Fischer, Adolf; Rosche, Paul; Troll, Helmar; Wurst, Wolfgang; Hengl, Helmut; and Seidl, Jiri, 4,111,163, Cl. 123-52.00M.

Henkel Inc.: *See*—
Lindner, Robert Arthur; and Limon, Robert James, 4,111,886, Cl. 260-31.80T.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Abendroth, Henning; Galinke, Joachim; and Wiemers, Norbert, 4,111,880, Cl. 260-29.6MP.

Henrichon, Lucien. Ski trail forming and conditioning drag. 4,110,919, Cl. 37-10.000.

Henry, David W.; and Tong, George L., to SRI International. Bishydrazones of daunomycin and adriamycin. 4,112,217, Cl. 536-4.000.

Henry, Edgar. Adjustable garment assembly. 4,111,309, Cl. 211-104.000.

Hepner, Georges; and Desormiere, Bernard, to Thomson-CSF. Magnetomer using a thin magnetic film optical waveguide with a.c. modulation and automatic nulling. 4,112,367, Cl. 324-244.000.

Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources: *See—*
Porteous, Kenneth; Falkenberg, Leigh; and Lane, Stephen, 4,111,789, Cl. 208-11.0LE.

Her Majesty the Queen in right of the Province of Alberta, Department of, Education Energy and Natural Resources, Alberta Syncrude Equity: *See—*
Porteous, Kenneth; Falkenberg, Leigh; and Lane, Stephen, 4,111,789, Cl. 208-11.0LE.

Herbert, Colin Wray. Apparatus facilitating removal of a kort rudder ring on a marine vessel. 4,111,148, Cl. 115-76.000.

Herman, Frederick L.: *See—*
Dixon, Dale D.; and Herman, Frederick L., 4,111,877, Cl. 260-29.60R.

Herman, Gerald J., to Williams Research Corporation. Governor. 4,110,974, Cl. 60-39.28R.

Hermann Finckh Maschinenfabrik: *See—*
Holz, Emil, 4,111,373, Cl. 241-46.110.

Hernandez, Robert. Combined scarf and hood. 4,110,846, Cl. 2-203.000.

Herouard, Dominique: *See—*
Colin, Jean-Michel; and Herouard, Dominique, 4,111,554, Cl. 356-36.000.

Herrling, Siegfried: *See—*
van Wersch, Hubert Maria Agnes; Herrling, Siegfried; and Muckter, Heinrich, 4,112,077, Cl. 424-185.000.

Herron, Keith Roderick, to James Kemp & Co. Pty. Ltd. Drilling holes in pressurized pipes. 4,111,588, Cl. 408-110.000.

Hessel, Stephen Roy, to C. R. Bard, Inc. Suction collection system. 4,111,204, Cl. 128-276.000.

Hessler, Edward J., to Upjohn Company, The. Process. 4,111,968, Cl. 260-465.600.

Heuckroth, Carl C. Welding wire spool shroud. 4,111,380, Cl. 242-128.000.

Heurtey Metallurgie: *See—*
Kissel, Roland; and Wang, Robert, 4,111,154, Cl. 118-10.000.

Hewes, Charles R.: *See—*
Holmes, Jerry D.; Johnson, Charles R.; Jones, Allen S.; and Hewes, Charles R., 4,112,372, Cl. 325-321.000.

Hewlett-Packard Company: *See—*
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Heydner, Konrad, to Ellenberger & Poensgen GmbH. Electrically operated door lock. 4,111,474, Cl. 292-144.000.

Hi-Shear Corporation: *See—*
Wing, George S., 4,111,568, Cl. 403-2.000.

Hibino, Eiichi: *See—*
Ito, Katsuo; Murata, Bunjiro; Maeda, Yoji; and Hibino, Eiichi, 4,112,378, Cl. 325-464.000.

Hickling, Colin D., to American Thermostat Corporation. Duplex thermostat. 4,112,406, Cl. 337-338.000.

Hickman, Donald A.; and Kershaw, Samuel L., to Caterpillar Tractor Co. Method and apparatus for mounting a vehicle wheel on a vehicle frame. 4,111,455, Cl. 280-690.000.

Hicks, William R.; and Woodard, Richard S., to General Electric Company. Food processor interlock. 4,111,372, Cl. 241-37.500.

Higuchi, Noboru; Ogasawara, Takayuki; and Seike, Shoji, to Nippon Gaishi Kabushiki Kaishi. Electrical insulators. 4,112,193, Cl. 428-539.000.

Hilbrink, Johan O. System for optically entering, displaying and decoding handwritten symbols. 4,112,415, Cl. 340-146.3SY.

Hildreth, John David: *See—*
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Hill, David T., to SmithKline Corporation. Bis(sulfide)gold(1+) salts. 4,112,113, Cl. 424-275.000.

Hilliard, Lonnie George; and Verzemnieks, Juris, to Boeing Company, The. Low non-linearity factor sound attenuating laminate. 4,111,081, Cl. 181-290.000.

Hillman, William S., II, to Phillips Petroleum Company. Control system for plurality of gas supplies. 4,111,637, Cl. 431-12.000.

Himeno, Yoshiaki, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Apparatus for detecting leakage of liquid sodium. 4,112,417, Cl. 340-605.000.

Hinago, Yasuhiro, to Nippon Gakki Seizo Kabushiki Kaisha. Touch response sensor for an electronic musical instrument. 4,111,091, Cl. 84-1.010.

Hincklieff, Henry Russell; and Banwell, Richard Hugh, to Imperial Chemical Industries Limited. Smoking mixtures. 4,111,211, Cl. 131-2.000.

Hindermann, Peter; Adam, Jean-Marie; and Karlen, Urs, to Ciba-Geigy Corporation. 1,5-Dihydroxy-4,8-diamino-anthraquinone compounds arylated in 3-position. 4,111,966, Cl. 260-373.000.

Hinrichsen, Gerhard: *See—*
Reiner, Udo; and Hinrichsen, Gerhard, 4,112,498, Cl. 364-728.000.

Hippchen, Hermann; Schneider, Hans-Georg; and Schwingeler, Renate, to Pfeifer & Langen. Process for obtaining amino acids from the raw juices of sugar manufacture. 4,111,714, Cl. 127-46.00A.

Hipwell, Donald D.; and Menzel, Klaus Rudolf, to Bendix Machine Tool Corporation. Apparatus for automatically changing tool heads. 4,110,897, Cl. 29-568.000.

Hirai, Hironori: *See—*
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Hirama, Hideo, to Kabushiki Kaisha Daini Seikosha. Material handling unit. 4,111,311, Cl. 214-1.0BC.

Hirata, Shigekazu: *See—*
Fujimori, Shigeaki; Hirata, Shigekazu; and Kitamura, Akira, 4,110,863, Cl. 15-104.10C.

Hirsch, Martin: *See—*
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Hirschmann, Peter: *See—*
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Hisatomi, Takashi: *See—*
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Hitachi Denshi Engineering Kabushiki Kaisha: *See—*
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Hitachi Denshi Kabushiki Kaisha: *See—*
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo; Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, 4,112,260, Cl. 179-18.0FC.

Hitachi, Ltd.: *See—*
Hasegawa, Akiji; Yasuda, Isao; and Kobayashi, Kazuhiko, 4,112,416, Cl. 340-147.00R.
Ishikawa, Toshio; Ozawa, Jun; and Tamura, Masaoki, 4,112,418, Cl. 340-659.000.
Itoh, Kiyoo, 4,112,508, Cl. 365-154.000.
Kinoshita, Hiroshi; Iwasaka, Tatsuo; and Hanmura, Hisao, 4,112,419, Cl. 340-560.000.
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo; Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, 4,112,260, Cl. 179-18.0FC.
Miyagi, Hiroyuki; Nakajima, Fumito; and Arikawa, Yoshijiro, 4,112,297, Cl. 250-288.000.
Miyamoto, Hiroshi; and Shinagawa, Mitsuhisa, 4,112,373, Cl. 325-440.000.
Nagasaki, Tadashi; Akatsu, Mitsuharu; and Ohtsu, Mitsuo, 4,112,337, Cl. 315-411.000.
Nagasawa, Kouichi; Kosa, Yasunobu; and Meguro, Satoshi, 4,110,899, Cl. 29-571.000.
Nishimiya, Torazo; Oyama, Yoshishige; and Oshima, Ryoichiro, 4,110,978, Cl. 60-276.000.
Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, 4,111,724, Cl. 148-175.000.
Ohhinata, Ichiro, 4,112,315, Cl. 307-254.000.
Sakazume, Akio; Iwata, Hiroshi; Nakamura, Hiroo; Ogawa, Hiroyuki; Kashiwazaki, Susumu; and Nakao, Saneaki, 4,111,000, Cl. 62-262.000.
Takahasi, Toru; Ueno, Sadayasu; and Inui, Tomoji, 4,112,478, Cl. 361-162.000.
Tamura, Teizou; and Konishi, Katsuo, 4,110,902, Cl. 29-603.000.
Tokunaga, Michio; Ohhinata, Ichiro; and Okuhara, Shinzi, 4,112,346, Cl. 323-4.000.

Hitachi Metals: *See—*
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Hitchler, Edward Willard; and Klein, Albert Joseph, to American Can Company. Strip cast aluminum heat treatment. 4,111,721, Cl. 148-2.000.

Hiyamori, Yasuchika: *See—*
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Hlavka, Joseph John, to American Cyanamid Company. Acyl derivatives of antibiotic BM123γ. 4,112,219, Cl. 536-17.000.

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Hoch, Samuel; and Szabo, Emery, to Tenneco Chemicals, Inc. Organotin compounds and vinyl halide resin compositions stabilized therewith. 4,111,903, Cl. 260-45.75S.

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Hoddinott, David C.; and Brown, Albert P., to Crompton & Knowles Corporation. Continuous strand winding apparatus. 4,111,376, Cl. 242-25.00A.

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Hodson, Donald R., to Rockwell International Corporation. Rupturable flywheel energy system. 4,111,067, Cl. 74-572.000.

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Kostrzewa, Michael; and Muck, Karl-Friedrich, 4,111,858, Cl. 521-25.000.
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Sextro, Gunter; Burg, Karlheinz; Schlaf, Helmut; Sabel, Hans-Dieter; and Heller, Alwin, 4,111,912, Cl. 528-45.000.

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Huber, Thomas L., to Research Corporation. Treatment of ruminants. 4,112,069, Cl. 424-93.000.

Huber, Ulrich, to Givaudan Corporation. Process for preparing polyphenols. 4,112,003, Cl. 260-613.00D.

Hubner, Rolf H. Apparatus for monitoring the solvent content of air. 4,111,034, Cl. 73-23.000.

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Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, to Gates Rubber Company, The. Spirally wound electrochemical cell and method and apparatus for its production. 4,112,202, Cl. 429-94.000.

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Huret, Jacques Andre. Device for transmitting movement to a speed indicator instrument and/or a distance counter. 4,111,059, Cl. 74-12.000.
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Hurt, William S., to Rohm and Haas Company. Pesticidal O,S-dialkyl O-sulfonyloxyphenyl phosphorothiolates and phosphorodithioates. 4,112,083, Cl. 424-215.000.
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Hauke, Francis Edward; McCully, Everette Ray; McElroy, Robert Marion, Jr.; Stevenson, Peter Alan; Vogel, Stephen Martin; and Woods, John Walton, 4,112,472, Cl. 360-102.000.
Mader, Siegfried R.; Masters, Burton J.; and Pogge, H. Bernhard, 4,111,719, Cl. 148-1.500.
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Kaneko, Akira; Ishibashi, Ichiroh; and Nakano, Eisyo, 4,111,889, Cl. 260-31.80M.
Ishida, Hajime, to Tomy Kogyo Co., Ltd. Folding bicycle. 4,111,447, Cl. 280-278.000.
Ishida, Hiroaki: *See*—
Yonemoto, Tomoo; Morino, Yukio; Ishida, Hiroaki; and Nagaoka, Shinji, 4,112,444, Cl. 354-106.000.
Ishida, Yasuhiko: *See*—
Miyagi, Hideo; Oishi, Kiyohiko; Ishida, Yasuhiko; and Yamaguchi, Shunzo, 4,110,979, Cl. 60-276.000.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,111,434, Cl. 277-3.000.
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Yamada, Kantaro, to Mitsubishi Rayon Co., Ltd. Process for producing unsaturated aldehydes, and unsaturated fatty acids. 4,111,984, Cl. 562-538.000.
Ishii, Hiromichi: *See*—
Okada, Kazuya; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,111,985, Cl. 562-546.000.
Ishii, Hiroyuki, to Sugatsune Industrial Co., Ltd. Caster equipped with a stopper. 4,110,866, Cl. 16-35.00R.
Ishii, Masaji: *See*—
Nakajima, Yukihiko; Watanabe, Shuzou; Miyai, Akira; and Ishii, Masaji, 4,112,290, Cl. 219-275.000.
Ishii, Tsumoru: *See*—
Sera, Hidefumi; Shiraishi, Hisashi; and Ishii, Tsumoru, 4,111,926, Cl. 260-117.000.
Ishii, Yasuo: *See*—
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo; Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, 4,112,260, Cl. 179-18.0FC.
Ishikawa, Takashi: *See*—
Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, 4,111,724, Cl. 148-175.000.
Ishikawa, Toshio; Ozawa, Jun; and Tamura, Masaoki, to Hitachi, Ltd. Lightning current responsive alarm. 4,112,418, Cl. 340-659.000.
Ishimaru, Kenzo, to Beckman Instruments, Inc. Multi-compartment centrifuge rotor liner. 4,111,355, Cl. 233-20.00R.
Ishizuka, Ichiro: *See*—
Yukinaga, Hisajiro; Sumimoto, Shinzaburo; Ishizuka, Ichiro; and Sugita, Jitsuo, 4,111,680, Cl. 71-88.000.
Isuzu Motors Limited: *See*—
Kimbara, Motoyasu, 4,111,365, Cl. 239-93.000.
Ithaco, Incorporated: *See*—
Jorgensen, Hans G.; and Hautaniemi, B. Wendell, 4,111,054, Cl. 73-611.000.
Ito, Hidehumi: *See*—
Torii, Shinkity; Kawagoshi, Sakae; Yoneshige, Tetsuhiko; and Ito, Hidehumi, 4,111,848, Cl. 252-466.0PT.
Ito, Katsuo; Murata, Bunjiro; Maeda, Yoji; and Hibino, Eiichi, to Murata Manufacturing Co., Ltd. Television tuner circuit for selection of VHF and UHF/VHF converted television signals. 4,112,378, Cl. 325-464.000.
Ito, Shohei, to Seiko Seiki Kabushiki Kaisha. Infeeding method for internal grinders. 4,110,938, Cl. 51-281.00R.
Ito, Toshimichi: *See*—
Inayoshi, Akio; Ito, Toshimichi; Nagatoshi, Kikuo; Nara, Toshihide; Sagata, Shinsuke; Tomari, Hitomi; Fujimoto, Noriki; and Kaji, Hidehiko, 4,111,898, Cl. 260-42.530.
Ito, Yukio; and Morishima, Susumu, to Hitachi Denshi Engineering Kabushiki Kaisha; and Musashi Kabushiki Kaisha. Apparatus for clamping and binding a stack of paper. 4,111,116, Cl. 100-281.000.
Itoga, Masaaki: *See*—
Asakura, Toshiyuki; Itoga, Masaaki; Hayakawa, Takeshi; and Tanimura, Masamitsu, 4,112,187, Cl. 428-474.000.
Itoh, Kiyoo, to Hitachi, Ltd. Semiconductor memory. 4,112,508, Cl. 365-154.000.
Itoh, Schun'ichi: *See*—
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo; Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, 4,112,260, Cl. 179-18.0FC.
ITT Industries, Incorporated: *See*—
Andersson, Karl-Gunnar; and Sjostrand, Karl Evert, 4,111,611, Cl. 417-360.000.
ITW de France, S.A.: *See*—
Morel, Henri, 4,111,570, Cl. 403-18.000.
Ivanova, Tatyana Lukyanovna: *See*—
Vishnevsky, Alexandr Alexandrovich; Korolkov, Ivan Alexandrovich; Smirnov, Boris Andreevich; Ivanova, Tatyana Lukyanovna; Adamian, Arnold Aramovich; and Mitkova, Galina Vladimirovna, 4,111,206, Cl. 128-305.000.
Iwaki, Shigeo: *See*—
Ueno, Zene; Morita, Akira; Iwaki, Shigeo; Nagaoka, Tadahiko; and Inagaki, Tokuich, 4,111,161, Cl. 123-3.000.
Iwasaka, Tatsuo: *See*—
Kinoshita, Hiroshi; Iwasaka, Tatsuo; and Hanmura, Hisao, 4,112,419, Cl. 340-560.000.
Iwata, Hiroshi, to West Electric Co, Ltd. Flash and camera device. 4,112,447, Cl. 354-145.000.
Iwata, Hiroshi: *See*—
Sakazume, Akio; Iwata, Hiroshi; Nakamura, Hiroo; Ogawa, Hiroyuki; Kashiwazaki, Susumu; and Nakao, Saneaki, 4,111,000, Cl. 62-262.000.
Izawa, Taro: *See*—
Mori, Kogoro; Izawa, Taro; Mizuno, Yoshifumi; and Matsui, Sadayoshi, 4,111,879, Cl. 260-29.60N.
Izon Corporation: *See*—
Yevick, George Johannus, 4,111,695, Cl. 96-40.000.
Izumi, Hideki: *See*—
Amemori, Hiroyuki; Izumi, Hideki; and Tanaka, Katsuyuki, 4,111,046, Cl. 73-231.00R.
J.F. Enterprises, Inc.: *See*—
Acker, Donald J., 4,110,855, Cl. 5-45.000.
J. I. Case Company: *See*—
Frisbee, Claude M., 4,111,268, Cl. 172-805.000.
J. Ray McDermott & Co.: *See*—
Reiher, Max A. W.; and Faust, Richard C., 4,111,313, Cl. 214-15.00R.
J. Young (Scientific Glassware) Ltd.: *See*—
Young, James, 4,111,440, Cl. 277-165.000.
Jack, James, to Bakelite Xylonite Limited. Process for the productions of multi-cellular stretched articles. 4,111,860, Cl. 521-84.000.
Jackson, R. Neil: *See*—
Van Pool, Joe; and Jackson, R. Neil, 4,111,805, Cl. 210-71.000.
Jacobs, David R.: *See*—
Spanel, Abram N.; Eiland, P. Frank; and Jacobs, David R., 4,111,136, Cl. 112-79.00R.
Jacobs Manufacturing Company, Limited, The: *See*—
Derbyshire, George Cecil, 4,111,079, Cl. 81-90.00A.
Jacobs, Max. Building front rope lift. 4,111,281, Cl. 182-10.000.
Jacobs, Stanley A. Latch handle and container lock. 4,111,476, Cl. 292-246.000.
Jacobs, Stanley C.: *See*—
Stoehr, Robert A.; Ormesher, Robert J.; and Jacobs, Stanley C., 4,111,764, Cl. 204-64.00R.
Jacobson, Ronald H.; and Miller, Brian J. Wire wrapping and cut-off tool. 4,111,242, Cl. 140-124.000.
Jacquelin, Jean, to Compagnie Generale d'Electricite S.A. Electrolytic resistor. 4,112,409, Cl. 338-222.000.
Jaeger, Robert Charles, to Pennwalt Corporation. Dental chair headrest locking device. 4,111,483, Cl. 297-410.000.
Jaeger, Robert Charles, to Pennwalt Corporation. Dental chair headrest locking device. 4,111,484, Cl. 297-410.000.
Jager, Horst, to Ciba-Geigy Corporation. Heterocyclic nitrogen compounds, process for their manufacture and their use. 4,111,817, Cl. 252-8.800.
Jagger, Brian E., to Xerox Corporation. Apparatus for sensing when paper utilized in a printer has been depleted. 4,111,565, Cl. 400-708.000.
Jahns, Hans O.; Galate, Joseph W.; and Wheeler, John A., Jr., to Exxon Production Research Company. Split air convection pile. 4,111,258, Cl. 165-40.000.
Jaidinger, John H.; and Sakazaki, Mamoru, to Jaidinger Mfg. Co., Inc. Relay for printed circuits. 4,112,400, Cl. 335-128.000.
Jaidinger Mfg. Co., Inc.: *See*—
Jaidinger, John H.; and Sakazaki, Mamoru, 4,112,400, Cl. 335-128.000.
James, J. Michael; Fee, James F.; and Horton, Richard M., to Cyborg Corporation. Modular biofeedback training system. 4,110,918, Cl. 35-22.00R.
James Kemp & Co. Pty. Ltd.: *See*—
Herron, Keith Roderick, 4,111,588, Cl. 408-110.000.
Janakiev, Nikolai. Pressure vessel. 4,111,327, Cl. 220-3.000.
Jandl, Frank W.; and Colman, Gregory D., to United States of America, Navy. Pyrogen igniter ramjet ignition system. 4,110,977, Cl. 60-270.00R.
Janys Designs Limited: *See*—
Waski, Jane, 4,111,429, Cl. 273-271.000.
Japan Crown Cork Co., Ltd.: *See*—
Ichinose, Isao; Sakemoto, Mitsuhiro; and Suzuki, Noboru, 4,111,323, Cl. 215-230.000.
Japan Steel Works Limited, The: *See*—
Shiomi, Kozen; and Shimizu, Ryoichi, 4,111,630, Cl. 425-462.000.
Japanese National Railways: *See*—
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo;

Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, 4,112,260, Cl. 179-18.0FC.
Jaros, Frantisek: *See—*
Havel, Josef; Vobornik, Vaclav; Ripka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Planansky, Agaton; and Rehackova, Bozena, 4,110,961, Cl. 57-58.890.
Jarowenko, Wadym, to National Starch and Chemical Corp. Method of preparing hydroxypropylated starch derivatives. 4,112,222, Cl. 536-111.000.
Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, to Laboratories Made, S.A. Process for the preparation of 3,4,5-trimethoxy-phenyl-(1,4-dimethyl-1,2,3,6-tetrahydro-2-pyridyl)-carbinol. 4,111,945, Cl. 260-297.00R.
Jarvis, Alexander S., to Drisan Packaging Ltd. Food packaging system and method. 4,112,124, Cl. 426-234.000.
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., to Cutler-Hammer, Inc. Silicon thyristor sensitive to low temperature with thermal switching characteristics at temperatures less than 50° C. 4,112,458, Cl. 357-38.000.
Jastrow, Horst: *See—*
Noetzel, Siegfried; Jastrow, Horst; and Uebe, Rudolf, 4,111,900, Cl. 260-45.70P.
Jaudt, Andreas. Adjusting device for the gland packing of a flat slide-valve. 4,111,394, Cl. 251-214.000.
Jay, John; Bonner, Gary D.; and Betancourt, Osmundo J., to Canplan Filtration Limited. Filtration system. 4,111,801, Cl. 210-40.000.
Jensen, Arthur S.: *See—*
Lampe, Donald R.; White, Marvin H.; and Jensen, Arthur S., 4,112,456, Cl. 357-24.000.
Jensen, Ronald P., to Jensen, Ronald P. Intraocular lens for implantation into the posterior chamber of a human eye. 4,110,848, Cl. 3-13.000.
Jernow, Jane Liu: *See—*
Holland, George William; Jernow, Jane Liu; and Rosen, Perry, 4,112,225, Cl. 542-426.000.
Jerrold Electronics Corp.: *See—*
Everhart, Norman; and Brauer, Dieter Bruno, 4,112,386, Cl. 330-265.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Lavelle, Joseph E.; and Munroe, James L., 4,111,531, Cl. 350-293.000.
Jinotti, Walter J. Exerciser. 4,111,416, Cl. 272-96.000.
Johanson, Edwin S.: *See—*
Chervenak, Michael C.; and Johanson, Edwin S., 4,111,788, Cl. 208-10.000.
Johanson Manufacturing Corporation: *See—*
Johanson, Norman E.; and Seidler, Emil, 4,112,480, Cl. 361-271.000.
Johanson, Norman E.; and Seidler, Emil, to Johanson Manufacturing Corporation. Tunable extended range chip capacitor. 4,112,480, Cl. 361-271.000.
Johns-Manville Corporation: *See—*
Duensing, Willard John; and Miga, Christian John, 4,112,129, Cl. 426-417.000.
Hannes, George John; Rohweder, Theodore Richard; Dreikorn, Hans Wendell; and Shepherd, Philip Bickford, 4,112,174, Cl. 428-220.000.
Lambert, Gerard Lucien, 4,111,113, Cl. 100-74.000.
Pusch, Walter George, 4,111,712, Cl. 106-120.000.
Reynolds, Harold John, Jr., 4,111,891, Cl. 260-38.000.
Johnson, Charles R.: *See—*
Holmes, Jerry D.; Johnson, Charles R.; Jones, Allen S.; and Hewes, Charles R., 4,112,372, Cl. 325-321.000.
Johnson Controls, Inc.: *See—*
Matthews, Russell Byron, 4,111,639, Cl. 431-25.000.
Johnson, George William, to Lockheed Corporation. Compound curvature cutting machine. 4,111,085, Cl. 83-1.000.
Johnson & Johnson: *See—*
Beede, Charles H.; Waldman, Harold L.; and Blumig, Theodore, 4,111,922, Cl. 526-292.000.
Butterworth, George A. M.; and Fillwalk, Frank, 4,112,153, Cl. 427-390.00E.
Waldman, Harold Louis, 4,112,213, Cl. 526-279.000.
Johnson, Reynold B., to Microsonics Corporation. Hand held record player with record holding attachment. 4,111,430, Cl. 274-9.00B.
Johnson, Samuel B., to Allen-Bradley Company. Substrate with terminal connections and method of making the same. 4,110,904, Cl. 29-628.000.
Johnson, Wendell L.: *See—*
Getson, John C.; and Johnson, Wendell L., 4,111,890, Cl. 260-37.0SB.
Johnston, Gordon Boyd; and Strandberg, Hasse Eivind, to SKF Industrial Trading & Development Co., B.V. Bearing cage. 4,111,501, Cl. 308-201.000.
Jolanki, Jorma; Saxelin, Ilpo; and Ponni, Hannu, to Insinooritoimisto Innotec Oy. Method and apparatus for determining a property of a given substance. 4,111,560, Cl. 356-205.000.
Jones, Alan: *See—*
Firth, Jack Graham; Gentry, Stephen John; and Jones, Alan, 4,111,658, Cl. 23-232.00E.
Jones, Allen S.: *See—*
Holmes, Jerry D.; Johnson, Charles R.; Jones, Allen S.; and Hewes, Charles R., 4,112,372, Cl. 325-321.000.
Jones, D. B.: *See—*
Wilson, S. R.; and Jones, D. B., 4,112,474, Cl. 361-15.000.
Jones, Dale A. Method and projection apparatus. 4,112,438, Cl. 353-66.000.
Jones, Giffin D., to Dow Chemical Company, The. Radiation-curable polymers bearing quaternary nitrogen groups. 4,112,207, Cl. 526-17.000.
Jones, Peter Hadley: *See—*
Winn, Martin; Kyncl, Jaroslav; Dunnigan, Daniel Ambrose; and Jones, Peter Hadley, 4,112,097, Cl. 424-251.000.
Jones, Robert J.; O'Rell, Michael K.; and Hom, Jim M., to TRW Inc. Polyimides prepared from perfluoroisopropylidene diamine. 4,111,906, Cl. 528-229.000.
Jones, William C., to Markus, Franklyn M. Folding table and seat assembly. 4,111,482, Cl. 297-159.000.
Jonsson, Sven Erik; and Ekstrom, Olov Valter, to Siemens Aktiengesellschaft. Valve and switch device for measuring pressure of liquids in living objects. 4,112,272, Cl. 200-61.58R.
Jordan, David D., to Bendix Corporation, The. Steering linkage having resilient ring. 4,111,576, Cl. 403-134.000.
Jordan, Thomas F., to Continental Group, Inc., The. Reclosable vacuum container. 4,111,330, Cl. 220-306.000.
Jorgensen, Arne; Berthelsen, Poul; and Bassoe, Jorgen, to Lever Brothers Company. Trough-shaped folded cardboard container. 4,111,352, Cl. 229-31.00R.
Jorgensen, Hans G.; and Hautaniemi, B. Wendell, to Ithaco, Incorporated. Gravidity detection method and apparatus. 4,111,054, Cl. 73-611.000.
Joseph, Bernard W., to General Motors Corporation. Rotationally independent optical correlation for position determination. 4,111,526, Cl. 350-162.0SF.
Joseph, Mark. Coil with protection against overheating. 4,112,405, Cl. 337-4.000.
Jost, Victor: *See—*
Kiehl, Jean-Pierre; Jost, Victor; and Clavaud, Bernard Alain, 4,111,711, Cl. 106-97.000.
Joughin, Noel C.: *See—*
Glossop, Mark B.; Buckmaster, Adrian C.; Cook, Neville G. W.; Hojem, Justin P. M.; Joughin, Noel C.; Taylor, Richard F.; Cramp, Robert W.; and Hatcher, John L., 4,111,296, Cl. 198-519.000.
Journey, John, to Thexton Manufacturing Company. Belt enrailer and derailer. 4,111,063, Cl. 74-242.600.
Jousson, Pierre J., to Les Produits Associes LPA S.A. Pulsed liquid hygiene apparatus. 4,111,193, Cl. 128-66.000.
Joy Manufacturing Company: *See—*
Kendrick, Frank B., 4,111,066, Cl. 74-471.00R.
Junger, Hans: *See—*
Weissenfels, Franz; and Junger, Hans, 4,111,911, Cl. 260-38.000.
Junovich, July Moiseevich; Zhukovsky, Sergei Semenovich; Sudakas, Lev Girshovich; Turkina, Ljudmila Ivanovna; Smirnov, Anatoly Ilich; Lyass, Abram Moiseevich; and Teplyakov, Sergei Dmitrievich. Self-hardening moulding mixture for making foundry moulds and cores. 4,111,705, Cl. 106-38.350.
Jyo, Shigeru, to Tekken Kensetu Co. Ltd. Brush-type packing means for shield excavator. 4,110,992, Cl. 405-147.000.
Kabasawa, Yozo; and Tanimura, Takenori. Liquid-liquid extraction method and apparatus. 4,111,660, Cl. 423-8.000.
Kabbe, Hans-Joachim: *See—*
Eckert, Heiner; Ugi, Ivar; and Kabbe, Hans-Joachim, 4,111,933, Cl. 260-239.100.
Kabelschlepp Gesellschaft mit beschrankter Haftung: *See—*
Moritz, Werner, 4,111,236, Cl. 138-120.000.
Kabushiki Kaisha Daini Seikosha: *See—*
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Hirama, Hideo, 4,111,311, Cl. 214-1.0BC.
Kawashima, Hirofumi, 4,112,323, Cl. 310-348.000.
Kabushiki Kaisha Fuji Tekkosho: *See—*
Matsumoto, Yukimichi; and Ueyama, Minoru, 4,111,084, Cl. 82-48.000.
Kabushiki-Kaisha Kinsekisha-Kenkyujo: *See—*
Yamaguchi, Kazumasa; Nasaki, Kunio; and Ohshiro, Masanori, 4,112,324, Cl. 310-353.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Kasuya, Tamotsu, 4,111,598, Cl. 415-202.000.
Kabushiki Kaisha Ohara Kogaku Garasu Seizosho: *See—*
Komorita, Fujio; Nozawa, Nobuhiro; and Inoue, Satoshi, 4,111,707, Cl. 106-47.00Q.
Kabushiki Kaisha Tiger Machine Seisakusho: *See—*
Kitahara, Yutaka, 4,111,627, Cl. 425-421.000.
Kach, Alfred, to Patelhold Patentverwertungs & Elektro-Holding AG. Optical fiber data transmission system. 4,112,293, Cl. 250-199.000.
Kachik, Robert H., to United States Steel Corporation. Method of repairing slag and cinder pots and other heavy steel articles. 4,110,887, Cl. 29-401.00A.
Kahl, Donald L.: *See—*
Gale, Richard A.; and Kahl, Donald L., 4,111,617, Cl. 418-61.00B.
Kai, Shinichiro: *See—*
Torikai, Eiichi; Kawami, Youji; Kai, Shinichiro; Namba, Mutsusuke; and Simasaki, Shuhei, 4,111,866, Cl. 521-53.000.
Kaiser Aluminum & Chemical Corporation: *See—*
Donaldson, Donald J., 4,112,047, Cl. 423-123.000.
Kajan Specialty Company, Inc.: *See—*
Perkins, Lee E., 4,111,271, Cl. 175-297.000.
Kaji, Hidehiko: *See—*
Inayoshi, Akio; Ito, Toshimichi; Nagatoshi, Kikuo; Nara, Toshihide; Sagata, Shinsuke; Tomari, Hitomi; Fujimoto, Noriki; and Kaji, Hidehiko, 4,111,898, Cl. 260-42.530.

Kajima Corporation: *See—*
Sato, Kuniaki; Nakamura, Yoshihiro; and Ninomiya, Hideaki, 4,111,578, Cl. 403-189.000.

Kako, Yuji; Kikuga, Toyoji; and Toko, Akira, to Sumitomo Durez Company, Ltd. Solid adherend substrates bonded with rubber cement compositions. 4,112,160, Cl. 428-460.000.

Kaku, Masahiro: *See—*
Fukuyama, Hiroomi; and Kaku, Masahiro, 4,112,291, Cl. 235-92.0MP.

Kakukawa, Morio: *See—*
Funakoshi, Yoshiro; Asogawa, Tatsuo; Satake, Eiichi; Motoyama, Shimesu; Yamada, Shuri; and Kakukawa, Morio, 4,111,626, Cl. 425-203.000.

Kalbow, Heinz, to Collo GmbH. Method of making cleaning, scouring and/or polishing pads and the improved pad produced thereby. 4,111,666, Cl. 51-295.000.

Kalir, Asher: *See—*
Ashani, Yacov; Amitai, Gavriel; Grunfeld, Yona; Kalir, Asher; and Cohen, Sasson, 4,112,082, Cl. 424-209.000.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Diphenylamines for dyeing keratinous fibers. 4,112,229, Cl. 544-105.000.

Kamachi, Hajime: *See—*
Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, 4,112,228, Cl. 544-26.000.

Kamada, Kazumasa; and Hongo, Masafumi, to Mitsubishi Rayon Co., Ltd. Reinforced fire retardant resin composition improved in electrical characteristics. 4,111,892, Cl. 260-40.00R.

Kameyama, Yasuyoshi; and Suzaki, Satoru, to Matsushita Electric Works, Ltd. Fire sensing device. 4,112,407, Cl. 337-398.000.

Kamin, Gerhard Robert, to Robert Bosch GmbH. System for detecting a motion in the monitoring area of two or more television cameras. 4,112,463, Cl. 358-105.000.

Kaminow, Ivan Paul; and Kogelnik, Herwig Werner, to Bell Telephone Laboratories, Incorporated. Thin film optical waveguide. 4,111,523, Cl. 350-96.140.

Kaminow, Ivan Paul; and Presby, Herman Melvin, to Bell Telephone Laboratories, Incorporated. Silica based optical fiber waveguide using phosphorus pentoxide and germanium dioxide. 4,111,525, Cl. 350-96.310.

Kane, Cyril Cecil: *See—*
Conley, Earl, 4,111,167, Cl. 123-102.000.

Kaneko, Akira; Ishibashi, Ichiroh; and Nakano, Eisyo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Plasticized halogen containing rigid resin composition. 4,111,889, Cl. 260-31.80M.

Kanemaru, Kenji, to Fuji Photo Optical Co., Ltd. Control circuit for exposure information indicator. 4,112,440, Cl. 354-23.00D.

Kania, Sigmund: *See—*
Breitschwerdt, Werner; Kania, Sigmund; Ukena, Theodor; and Schwammle, Otto, 4,111,480, Cl. 296-28.00R.

Kanthal Corporation, The: *See—*
Haglund, John Helge, 4,111,254, Cl. 164-138.000.

Kanzaki Kokyukoki Mfg. Co., Ltd.: *See—*
Yamaoka, Kojiro; Mihara, Toshihide; and Tanaka, Akira, 4,110,898, Cl. 29-568.000.

Kao, Henry S.; Sklarz, William A.; and Weinstock, Leonard M., to Merck & Co., Inc. Process for the preparation of 4-methylthiazole. 4,111,948, Cl. 260-302.00R.

Kao Soap Co., Ltd.: *See—*
Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,111,990, Cl. 260-561.00R.

Karakis, Thomas G.: *See—*
Crepeau, Robert G.; and Karakis, Thomas G., 4,112,265, Cl. 200-31.00R.

Karayannis, Nicholas M.; and Grams, Harold, to Standard Oil Company (Indiana). Process for forming high performance titanium trichloride olefin polymerization catalyst components. 4,111,836, Cl. 252-429.00B.

Kardux, Kenneth H.: *See—*
Ward, William H.; Henderson, Henry F., Jr.; and Kardux, Kenneth H., 4,111,336, Cl. 222-58.000.

Karlen, Urs: *See—*
Hindermann, Peter; Adam, Jean-Marie; and Karlen, Urs, 4,111,966, Cl. 260-373.000.

Kasai, Hironao: *See—*
Fukuda, Shozo; Seike, Yajuro; Iizuka, Masafumi; Kasai, Hironao; and Enami, Mamoru, 4,111,811, Cl. 210-242.00S.

Kasai, Tsutomu: *See—*
Taninaka, Kuniaki; Kurono, Hitoshi; and Kasai, Tsutomu, 4,112,089, Cl. 424-248.550.

Kasberg, Alvin H.: *See—*
Eck, John E.; and Kasberg, Alvin H., 4,111,747, Cl. 176-40.000.

Kashio, Toshio, to Casio Computer Co., Ltd. Electronic timepiece with stop watch. 4,110,966, Cl. 58-4.00A.

Kashiwaya, Sadao: *See—*
Yoshida, Eiichi; Nakao, Hideo; Goto, Norimasa; Sugiyama, Toul; and Kashiwaya, Sadao, 4,112,141, Cl. 427-142.000.

Kashiwazaki, Susumu: *See—*
Sakazume, Akio; Iwata, Hiroshi; Nakamura, Hiroo; Ogawa, Hiroyuki; Kashiwazaki, Susumu; and Nakao, Saneaki, 4,111,000, Cl. 62-262.000.

Kassai Kabushiki Kaisha: *See—*
Kassai, Kenzou, 4,111,446, Cl. 280-275.000.

Kassai Kabushikikaisha: *See—*
Kassai, Kenzou, 4,111,454, Cl. 280-649.000.

Kassai, Kenzou, to Kassai Kabushiki Kaisha. Tricycle for children. 4,111,446, Cl. 280-275.000.

Kassai, Kenzou, to Kassai Kabushikikaisha. Folding baby carriage. 4,111,454, Cl. 280-649.000.

Kasuya, Tamotsu, to Kabushiki Kaisha Komatsu Seisakusho. Turbine casing for superchargers. 4,111,598, Cl. 415-202.000.

Katakura, Masayuki; and Yamada, Hisashi, to Tokyo Shibaura Electric Co., Ltd. Bias circuit. 4,112,387, Cl. 330-285.000.

Kato, Shogo: *See—*
Nakamura, Yukio; and Kato, Shogo, 4,112,448, Cl. 354-239.000.

Kato, Yoshio: *See—*
Etoh, Kuniomi; Tanaka, Shinichi; Kato, Yoshio; and Kazuo, Watanabe, 4,111,692, Cl. 96-1.00R.

Kattner, Erich; and Rosenstock, Guenter, to Siemens Aktiengesellschaft. Protective and cleaning device for writing heads in ink recorder devices. 4,112,435, Cl. 346-140.00R.

Katz, Jonathon H., to Teradyne, Inc. Circuit board testing apparatus. 4,112,364, Cl. 324-158.00F.

Kaufman, Paul Richard: *See—*
Marien, Bruce Arthur; and Kaufman, Paul Richard, 4,112,022, Cl. 260-881.000.

Kavick, Edward M., to Samuel Moore and Company. Hydraulic hose and coupling assembly. 4,111,469, Cl. 285-256.000.

Kawade, Junpei: *See—*
Kumaki, Yoshihiro; Kawade, Junpei; Takano, Toshiaki; and Inoue, Mitsuo, 4,111,486, Cl. 299-1.000.

Kawagishi, Shigemitsu; and Arisato, Yasunori, to Okuno Chemical Industry Co., Ltd. Electrolytic stripping bath for removing metal coatings from stainless steel base materials. 4,111,767, Cl. 204-146.000.

Kawagoshi, Sakae: *See—*
Torii, Shinkity; Kawagoshi, Sakae; Yoneshige, Tetsuhiko; and Ito, Hidehumi, 4,111,848, Cl. 252-466.0PT.

Kawai, Kiyohisa: *See—*
Noguchi, Shunsaku; Aono, Tetsuya; Araki, Yoshiaki; and Kawai, Kiyohisa, 4,111,997, Cl. 260-591.000.

Kawai Musical Instrument Mfg. Co. Ltd.: *See—*
Deutsch, Ralph, 4,111,090, Cl. 84-1.010.

Kawamata, Kiyoshi, to Nihon Seikan Kabushiki Kaisha. Apparatus for heating seams of cans. 4,111,142, Cl. 113-1.00E.

Kawami, Youji: *See—*
Torikai, Eiichi; Kawami, Youji; Kai, Shinichiro; Namba, Mutsusuke; and Simasaki, Shuhei, 4,111,866, Cl. 521-53.000.

Kawamura, Koichi; and Kawamura, Yoshiko. Portable water fountain display apparatus. 4,111,363, Cl. 239-20.000.

Kawamura, Takahide: *See—*
Nakamura, Norihiko; and Kawamura, Takahide, 4,111,175, Cl. 123-198.0DC.

Kawamura, Yoshiko: *See—*
Kawamura, Koichi; and Kawamura, Yoshiko, 4,111,363, Cl. 239-20.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Okuno, Ryuzo; Fujii, Hiroo; and Toyoda, Keio, 4,111,159, Cl. 122-27.000.

Kawasaki, Masahiro; and Sawada, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Digital display circuit for a photographic exposure meter. 4,112,439, Cl. 354-23.00D.

Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure control device. 4,112,441, Cl. 354-24.000.

Kawasaki, Teruo, to Nissan Motor Company, Limited. Wiring arrangement for blower motors of an air conditioner. 4,112,338, Cl. 318-59.000.

Kawashima, Hirofumi, to Kabushiki Kaisha Daini Seikosha. Circular flexural mode piezoelectric vibrator with integral support arms. 4,112,323, Cl. 310-348.000.

Kazuo, Watanabe: *See—*
Etoh, Kuniomi; Tanaka, Shinichi; Kato, Yoshio; and Kazuo, Watanabe, 4,111,692, Cl. 96-1.00R.

Kebabian, Paul L.: *See—*
Blau, Henry H., Jr.; and Kebabian, Paul L., 4,111,731, Cl. 156-86.000.
Blau, Henry H., Jr.; and Kebabian, Paul L., 4,112,028, Cl. 264-1.000.

Kegg, Larry R.: *See—*
Pankratz, Richard R.; and Kegg, Larry R., 4,111,087, Cl. 83-210.000.

Kelsey-Hayes Co.: *See—*
Bertolasi, Robert B., 4,112,423, Cl. 340-324.0AD.

Kempl, Willard E.; and Morrison, Bert L., to ACF Industries, Incorporated. Fabricated gate valve structure. 4,111,396, Cl. 251-328.000.

Kendall, Ben O.: *See—*
Laird, Willy S.; and Kendall, Ben O., 4,111,348, Cl. 228-181.000.

Kendrick, Frank B., to Joy Manufacturing Company. Control means. 4,111,066, Cl. 74-471.00R.

Kenhar Products Incorporated: *See—*
Hodge, Gerard; and Holsgrove, Robert J., 4,110,882, Cl. 29-118.000.

Kenigsberg, Irwin Jeffrey; and Eastman, Larry Bruce, to United Technologies Corporation. Helicopter rotor and transmission mounting and vibration isolation system. 4,111,386, Cl. 244-17.270.

Kent, Jan Herbert Farquharson, to Beverly Limited. Apparatus for preparing tread bands for use in tire retreading. 4,111,619, Cl. 425-43.000.

Kenwell, Edward A. Travelling hand support. 4,111,566, Cl. 401-6.000.

Kerr, Jack R. Lock nut forming apparatus. 4,110,858, Cl. 10-72.00R.

Kershaw, Joseph E., to United States of America, Navy. Method and means of link coupling with separate control of link reactance and coupling coefficient. 4,112,394, Cl. 333-6.000.

Kershaw, Samuel L.: *See*—
Hickman, Donald A.; and Kershaw, Samuel L., 4,111,455, Cl. 280-690.000.

Kessler, Harvey. Automobile tape storage case. 4,111,502, Cl. 312-10.000.

Kesten, Patrick N.: *See*—
Stimson, Grant L.; and Kesten, Patrick N., 4,112,330, Cl. 315-46.000.

Keyes, John, to Canron Railgroup. Switch lifting frame. 4,111,128, Cl. 104-7.00B.

KFC Corporation: *See*—
Sullivan, Neal; and Cook, George E., 4,111,443, Cl. 219-497.000.

Kiehl, Jean-Pierre; Jost, Victor; and Clavaud, Bernard Alain, to Societe Europeenne des Produits Refractaires. Cements and concretes which contain them. 4,111,711, Cl. 106-97.000.

Kikuchi, Yoshikazu; Suzuki, Hirotsugu; and Yabe, Kenji, to Toray Industries, Inc. Sound insulating sheet containing lead fibers. 4,112,175, Cl. 428-236.000.

Kikuga, Toyoji: *See*—
Kako, Yuji; Kikuga, Toyoji; and Toko, Akira, 4,112,160, Cl. 428-460.000.

Kimbara, Motoyasu, to Isuzu Motors Limited. Fuel injection system and its nozzle holder. 4,111,365, Cl. 239-93.000.

King, M. Dale; and Binder, Kerry, to King, M. Dale. Electrically-powered tricycle. 4,111,274, Cl. 180-25.00R.

Kinkor, Charlene R.: *See*—
Roberts, Marvin E., 4,111,021, Cl. 70-406.000.

Kinoshita, Hiroshi; Iwasaka, Tatsuo; and Hanmura, Hisao, to Hitachi, Ltd. Apparatus for detecting the number of objects. 4,112,419, Cl. 340-560.000.

Kirby, Gary R. Breathing apparatus. 4,111,342, Cl. 137-557.000.

Kirby, Robert Willis, to Hampton Industries, Inc. Cuff making machine. 4,111,137, Cl. 112-121.150.

Kissel, Roland; and Wang, Robert, to Heurtey Metallurgie. Apparatus for the surface treatment of galvanized sheet-iron. 4,111,154, Cl. 118-10.000.

Kissinger, Charles W., to United States of America, Navy. Apparatus for compensating a ballistic missile for atmospheric perturbations. 4,111,382, Cl. 244-3.100.

Kitada, Chieko: *See*—
Fujino, Masahiko; Nishimura, Osamu; and Kitada, Chieko, 4,111,924, Cl. 260-112.50R.

Kitaguchi, Koji: *See*—
Inoue, Sho; Sano, Akira; and Kitaguchi, Koji, 4,112,218, Cl. 536-5.000.

Kitahara, Yutaka, to Kabushiki Kaisha Tiger Machine Seisakusho. Apparatus for molding concrete-blocks. 4,111,627, Cl. 425-421.000.

Kitajima, Sigenori: *See*—
Norimatsu, Hideaki; Kobayashi, Akio; Masuda, Akira; and Kitajima, Sigenori, 4,111,162, Cl. 123-32.0EE.

Kitamura, Akira: *See*—
Fujimori, Shigeaki; Hirata, Shigekazu; and Kitamura, Akira, 4,110,863, Cl. 15-104.10C.

Kitamura, Shinzo. Suspension system of bobbin hanger. 4,111,381, Cl. 242-130.200.

Kiyosawa, Kesaomi, to Nihon Space Union Co., Ltd. Tube joint. 4,111,577, Cl. 403-172.000.

Klann, Paul A. Photographic distortion apparatus. 4,111,551, Cl. 355-84.000.

Kleeb, Markus, to Tschudin & Heid AG. Push-button switch units. 4,112,277, Cl. 200-153.00J.

Klein, Albert Joseph: *See*—
Hitchler, Edward Willard; and Klein, Albert Joseph, 4,111,721, Cl. 148-2.000.

Klein, Gerhart Paul; Oliver, John N.; and Fitchman, Arthur Emil, to P. R. Mallory & Co., Inc. Cathode coating apparatus. 4,111,155, Cl. 118-642.000.

Klein, Rudolph J., to Monarch Marking Systems, Inc. Record feeding apparatus and method. 4,112,344, Cl. 318-685.000.

Klein, Werner: *See*—
Schroder, Hubert; and Klein, Werner, 4,112,142, Cl. 427-166.000.

Kless, Benjamin, to Vwnding Components, Inc. Method of making induction coils. 4,110,903, Cl. 29-605.000.

Kline, Dennis D. Pool structure. 4,110,852, Cl. 4-172.000.

Klitzky, Bruce R.: *See*—
Wade, Jackie F.; Peyton, John E.; Klitzky, Bruce R.; and Groff, Roy E., 4,111,762, Cl. 204-33.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Biegel, Peter; and Dumont, Anton, 4,111,403, Cl. 266-58.000.

Klockner-Werke AG: *See*—
Grisar, Ulrich; and Berstermann, Wilhelm, 4,111,556, Cl. 356-86.000.

Klotz, Michael C.; and Mei, Viung C., to Dole Refrigeration Company. Hot gas defrost system. 4,110,997, Cl. 62-81.000.

Klundt, Kurt, to Pfaff Industriemaschinen GmbH. Multineedle guard construction. 4,111,139, Cl. 112-226.000.

Knapp, Malcolm H.: *See*—
Lazarus, Allan K.; and Knapp, Malcolm H., 4,111,821, Cl. 252-49.900.

Knifton, John F., to Texaco Inc. Process for preparing lower lactams from allylic amine substrates. 4,111,952, Cl. 260-326.5FN.

Knigge, Heinz Friedrich, to Lummus Company, The. Oil filter. 4,111,814, Cl. 210-323.00T.

Knight, Houston W., to FMC Corporation. Torsionally controlled swivel joint. 4,111,465, Cl. 285-114.000.

Knight, Stephen Vincent, to North Western Scaffolding Company Limited. Scaffolding. 4,111,579, Cl. 403-387.000.

Knourek, Jaroslav: *See*—
Kouril, Oldrich; and Knourek, Jaroslav, 4,112,366, Cl. 324-208.000.

Kob, Adolf; and Blatner, Eduard, to Bayerische Motoren Werke AG. Inflatable restraining device for motor vehicles. 4,111,457, Cl. 280-728.000.

Kobayashi, Akio: *See*—
Norimatsu, Hideaki; Kobayashi, Akio; Masuda, Akira; and Kitajima, Sigenori, 4,111,162, Cl. 123-32.0EE.

Kobayashi, Juichi: *See*—
Sato, Mitsuo; Miyagawa, Norio; and Kobayashi, Juichi, 4,112,190, Cl. 428-457.000.

Kobayashi, Kazuhiko: *See*—
Hasegawa, Akiji; Yasuda, Isao; and Kobayashi, Kazuhiko, 4,112,416, Cl. 340-147.00R.

Kobayashi, Kazuo; Suzuki, Akira; Tanaka, Motoharu; Inaba, Norihiko; and Yuyama, Hisao, to Ricoh Co., Ltd. Dry developing powder including toner powders of different particle size. 4,111,823, Cl. 252-62.10P.

Kobayashi, Masao: *See*—
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Yamada, Kantaro, 4,111,984, Cl. 562-538.000.
Okada, Kazuya; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,111,985, Cl. 562-546.000.

Kobayashi, Yoshimitsu: *See*—
Okano, Takeshi; Wada, Naoto; and Kobayashi, Yoshimitsu, 4,112,241, Cl. 560-246.000.

Kockler, Barry C.; and Beaty, Ronald L., to Xerox Corporation. Ribbon transporting and shifting mechanism. 4,111,293, Cl. 400-208.000.

Kodama, Yutaka: *See*—
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,112,090, Cl. 424-251.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Kutzner, Willi Albert Peter; and Schneider, Georg, 4,111,122, Cl. 101-228.000.

Koenig, Richard J.: *See*—
Harmon, Kenneth B.; Koenig, Richard J.; and Lentz, Carl A., 4,111,072, Cl. 74-864.000.

Kogelnik, Herwig Werner: *See*—
Kaminow, Ivan Paul; and Kogelnik, Herwig Werner, 4,111,523, Cl. 350-96.140.

Kohara, Tadao, to Maruzen Sewing Machine Co., Ltd. Sewing machine cabinet. 4,111,503, Cl. 312-27.000.

Kohl, David: *See*—
Abramson, Carl N.; Kohl, David; and Ogen, Thomas, 4,112,264, Cl. 179-175.30R.

Kohler Co.: *See*—
Fenton, Alvin P.; Gault, Roger T.; and Bernauer, Lawrence J., 4,111,176, Cl. 123-198.0DB.

Kohler, Helmut, to Siemens Aktiengesellschaft. Contact structure for electrical switching apparatus. 4,112,275, Cl. 200-147.00R.

Kohori, Kiyotaka. Center assembly including oil reservoir for machine tools. 4,111,082, Cl. 82-33.00R.

Kojima, Hajime: *See*—
Nakamura, Yoshimitsu; and Kojima, Hajime, 4,110,901, Cl. 29-598.000.

Kokubu, Yoshikazu: *See*—
Murayama, Naohiro; Fukuda, Makoto; Sakagami, Teruo; Suzuki, Shirou; Kokubu, Yoshikazu; and Enoki, Toshio, 4,111,780, Cl. 204-266.000.

Koleske, Joseph Victor: *See*—
Bailey, Frederick Eugene; and Koleske, Joseph Victor, 4,111,876, Cl. 260-29.6RB.

Kolombos, Alexander John; McNeice, Donald; and Wood, Dennis Charles, to British Petroleum Company Limited, The. Olefins production. 4,111,793, Cl. 208-121.000.

Kolombos, Alexander John, to British Petroleum Company Limited, The. Oligomerization process. 4,112,011, Cl. 260-683.15R.

Komatsu, Kogiro: *See*—
Mabuchi, Kenichi; and Komatsu, Kogiro, 4,112,201, Cl. 429-62.000.

Komatsu, Miwako: *See*—
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,112,090, Cl. 424-251.000.

Komorita, Fujio; Nozawa, Nobuhiro; and Inoue, Satoshi, to Kabushiki Kaisha Ohara Kogaku Garasu Seizosho. Optical glass. 4,111,707, Cl. 106-47.00Q.

Komuro, Keiji; Ohishi, Tetsu; Waku, Tetsuo; Sugi, Nagatoshi; Suzuki, Souichi; and Ueda, Akio, to Nippon Zeon Co., Ltd. Rubber composition for tire treads. 4,111,867, Cl. 260-5.000.

Kondo, Hiroyuki: *See*—
Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, 4,111,724, Cl. 148-175.000.

Kondo, Toshihiro, to Fuji Photo Film Co., Ltd., a part interest. Shutter device for a photographic camera. 4,112,450, Cl. 354-235.000.

Konishi, Katsuo: *See*—
Tamura, Teizou; and Konishi, Katsuo, 4,110,902, Cl. 29-603.000.

Kopp, Hermann, to Max Weishaupt GmbH. Burner for liquid fuels. 4,111,642, Cl. 431-347.000.

Koppers Company, Inc.: *See*—
League, John S., IV, 4,111,669, Cl. 55-112.000.
Leaver, Richard Hazen, 4,111,632, Cl. 425-382.00R.

Korenaga, Hiroshi: *See*—
Kotera, Norio; Okabe, Hiromichi; and Korenaga, Hiroshi, 4,111,979, Cl. 260-509.000.
Kornis, Gabriel: *See*—
Moon, Malcolm W.; and Kornis, Gabriel, 4,111,939, Cl. 260-293.600.
Moon, Malcolm W.; and Kornis, Gabriel, 4,111,941, Cl. 260-293.600.
Korolkov, Ivan Alexandrovich: *See*—
Vishnevsky, Alexandr Alexandrovich; Korolkov, Ivan Alexandrovich; Smirnov, Boris Andreevich; Ivanova, Tatyana Lukyanovna; Adamian, Arnold Aramovich; and Mitkova, Galina Vladimirovna, 4,111,206, Cl. 128-305.000.
Korotkov, Albert Nikitovich: *See*—
Lakomsky, Viktor Iosifovich; Sheiko, Ivan Vasilievich; Grigorenko, Georgy Mikhailovich; Torkhov, Gennady Fedorovich; Trigub, Vladimir Kirillovich; Korotkov, Albert Nikitovich; Kurganov, Viktor Mikhailovich; Moshkevich, Evgeny Isaevich; Pakhomov, Alexei Ivanovich; and Verkhovtsev, Emil Vasilievich, 4,112,246, Cl. 13-2.00P.
Kosa, Yasunobu: *See*—
Nagasawa, Kouichi; Kosa, Yasunobu; and Meguro, Satoshi, 4,110,899, Cl. 29-571.000.
Koss, Muriel L., to Rohr Industries, Inc. Acoustical laminate. 4,112,164, Cl. 428-116.000.
Kostrzewa, Michael; and Muck, Karl-Friedrich, to Hoechst Aktiengesellschaft. Process for the preparation of polyhydroxy methylene ethers and ion exchangers composed thereof. 4,111,858, Cl. 521-25.000.
Kotera, Norio; Okabe, Hiromichi; and Korenaga, Hiroshi, to Sumitomo Chemical Company, Limited. Process for producing 8-amino-1-naphthol-3,6-disulfonic acid. 4,111,979, Cl. 260-509.000.
Koumura, Noboru: *See*—
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,111,539, Cl. 355-3.00R.
Kouril, Oldrich; and Knourek, Jaroslav, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Electromagnetic displacement scanner using an E-shaped core oblique to the scan direction. 4,112,366, Cl. 324-208.000.
Kowalski, Henryk Zenon: *See*—
Dubik, Adam; Kowalski, Henryk Zenon; Osiennik, Pawel; and Krol, Franciszek, 4,112,295, Cl. 250-237.00G.
Kozima, Hiroshi: *See*—
Shima, Takesaburo; Kozima, Hiroshi; Yoshida, Tomio; and Nakamura, Joji, 4,112,021, Cl. 260-880.00R.
Kraft, Inc.: *See*—
Bosy, George; Edwards, Edwin N.; Hoffbeck, Willis M.; Silvio, Paul A.; and Warwick, Leonard A., 4,112,131, Cl. 426-582.000.
Krelis, Peter S.; and Prox, Larry M., to United States Steel Corporation. Seal between wall members of a metallurgical vessel enclosure. 4,111,405, Cl. 266-158.000.
Kremzow, Martin, to Siemens Aktiengesellschaft. Method and system for the production of sheet or platter shaped information carriers. 4,112,030, Cl. 264-25.000.
Krenzer, John, to Velsicol Chemical Company. Thiadiazolylimidazolidinone esters of tetrahydrofuryl substituted acids. 4,111,949, Cl. 260-306.80D.
Kresta, Jiri; and Shen, Chen S., to Dow Chemical Company, The. Initiators for isocyanate reactions. 4,111,914, Cl. 528-48.000.
Kreuder, Hans Joachim: *See*—
de Cleur, Eckhard; Dhein, Rolf; Rudolph, Hans; and Kreuder, Hans Joachim, 4,112,012, Cl. 260-835.000.
Krob, Erwin, to TMC Corporation. Release binding. 4,111,453, Cl. 280-626.000.
Krol, Franciszek: *See*—
Dubik, Adam; Kowalski, Henryk Zenon; Osiennik, Pawel; and Krol, Franciszek, 4,112,295, Cl. 250-237.00G.
Kruder, George A., to HPM Corporation. Vented injection molding machine and method. 4,112,519, Cl. 366-266.000.
Krudewig, William F.: *See*—
Caesar, Philip D.; Garwood, William E.; Krudewig, William F.; and Wise, John J., 4,111,792, Cl. 208-79.000.
Krueger, Hans; Mahlein, Hans F.; and Rauscher, Walter, to Siemens Aktiengesellschaft. Method of producing a film which promotes homeotropic orientation of liquid crystals and a liquid crystal utilizing the film. 4,112,157, Cl. 428-1.000.
Krueger, Hans: *See*—
Cirkler, Werner; and Krueger, Hans, 4,111,534, Cl. 350-345.000.
Krueger, Spencer Milton, to Eastman Kodak Company. o-Nitro-o-azaarylidene photobleachable dyes and photographic elements utilizing them. 4,111,699, Cl. 96-87.00R.
Krueger, Theodore H., Jr.; Eller, Robert; O'Brien, John; and Robbins, William L., to Seal Incorporated. Formation of metal parts. 4,111,255, Cl. 164-255.000.
Krupp-Koppers GmbH: *See*—
Lagemann, Gunther; and Heisterkamp, Wilhelm, 4,111,756, Cl. 201-41.000.
Kruschel, William A., to Minnesota Mining and Manufacturing Company. Manual crimping tool. 4,111,022, Cl. 72-410.000.
Kubota, Ltd.: *See*—
Matsuyoshi, Hideaki; Mori, Kazushige; and Shimono, Yukio, 4,111,319, Cl. 214-131.00A.
Kuehne, Rudi: *See*—
Eggert, Hans Joachim; Oberberger, Otto; Zenkert, Heinrich; and Kuehne, Rudi, 4,111,328, Cl. 220-4.00R.
Kuetterer, Gerhard: *See*—
Huettner, Robert; and Kuetterer, Gerhard, 4,112,304, Cl. 250-476.000.
Kugelfischer Georg Schafer & Co.: *See*—
Schuster, Friedrich; Thielemann, Max; and Lang, Otto, 4,110,962, Cl. 57-77.400.
Kuhls, Jurgen; Steininger, Alfred; and Fitz, Herbert, to Hoechst Aktiengesellschaft. Process for the manufacture of homo- and copolymers of tetrafluoroethylene employing as the reducing agent in the redox catalyst an ayodicarboxylic acid, salt of ayocarboxylic acid, azodicarbonamide, or mixtures thereof. 4,112,211, Cl. 526-219.000.
Kumaki, Yoshihiro; Kawade, Junpei; Takano, Toshiaki; and Inoue, Mitsuo, to Tekken Construction Co. Ltd. Method and system for performing attitude control of tunnel excavating shield. 4,111,486, Cl. 299-1.000.
Kumazawa, Toshiharu, to Mitsubishi Precision Co., Ltd. Bubble generating apparatus. 4,112,026, Cl. 261-29.000.
Kunzel, Hans Egon; and Bentz, Francis, to Bayer Aktiengesellschaft. Polyether urethanes as antistatic additives in polyamide compositions. 4,111,920, Cl. 526-6.000.
Kupsky, Frederick E. Method and apparatus for fabricating reticular sheet material. 4,111,028, Cl. 72-324.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kaneko, Akira; Ishibashi, Ichiroh; and Nakano, Eisyo, 4,111,889, Cl. 260-31.80M.
Murayama, Naohiro; Fukuda, Makoto; Sakagami, Teruo; Suzuki, Shirou; Kokubu, Yoshikazu; and Enoki, Toshio, 4,111,780, Cl. 204-266.000.
Sanada, Hisao; Saito, Ritaro; Funabashi, Masayuki; Inada, Kazuyoshi; and Seguchi, Koji, 4,112,053, Cl. 423-239.000.
Kurganov, Viktor Mikhailovich: *See*—
Lakomsky, Viktor Iosifovich; Sheiko, Ivan Vasilievich; Grigorenko, Georgy Mikhailovich; Torkhov, Gennady Fedorovich; Trigub, Vladimir Kirillovich; Korotkov, Albert Nikitovich; Kurganov, Viktor Mikhailovich; Moshkevich, Evgeny Isaevich; Pakhomov, Alexei Ivanovich; and Verkhovtsev, Emil Vasilievich, 4,112,246, Cl. 13-2.00P.
Kurka, Gerard: *See*—
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,111,260, Cl. 165-104.00S.
Kuroda, Seietsu: *See*—
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,112,090, Cl. 424-251.000.
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo; Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, to Hitachi Denshi Kabushiki Kaisha; Japanese National Railways; and Hitachi, Ltd. AC type line concentrator. 4,112,260, Cl. 179-18.0FC.
Kurono, Hitoshi: *See*—
Taninaka, Kuniaki; Kurono, Hitoshi; and Kasai, Tsutomu, 4,112,089, Cl. 424-248.550.
Kurple, Kenneth R.: *See*—
Holsopple, Dale B.; Kurple, Wasyl W.; Kurple, William M.; and Kurple, Kenneth R., 4,111,928, Cl. 260-124.00R.
Kurple, Wasyl W.: *See*—
Holsopple, Dale B.; Kurple, Wasyl W.; Kurple, William M.; and Kurple, Kenneth R., 4,111,928, Cl. 260-124.00R.
Kurple, William M.: *See*—
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Kurtz, Abraham N.; Cunningham, Robert W.; and Naumann, Alfred W., to Union Carbide Corporation. Oxidation of unsaturated aldehydes to unsaturated acids. 4,111,983, Cl. 562-535.000.
Kusel Equipment Company: *See*—
Smith, Gary R., 4,111,110, Cl. 99-456.000.
Kusumi, Jiro, to Tokyo Shibaura Electric Co., Ltd. Sound amplifier circuit. 4,112,385, Cl. 330-262.000.
Kutin, Lawrence H. Timer control arrangement for use with a wall switch. 4,112,313, Cl. 307-141.000.
Kutzner, Willi Albert Peter; and Schneider, Georg, to Koenig & Bauer Aktiengesellschaft. Method of and apparatus for threading web material preferably into web-fed rotary printing presses. 4,111,122, Cl. 101-228.000.
Kvita, Vratislav: *See*—
Darms, Roland; Kvita, Vratislav; and Greber, Gerd, 4,111,771, Cl. 204-159.220.
Kwalwasser, William David, to AMP Incorporated. Organic photoconductors and methods. 4,111,850, Cl. 252-501.000.
Kydd, Paul H., to General Electric Company. Bucket tip construction for open circuit liquid cooled turbines. 4,111,604, Cl. 416-97.00R.
Kyncl, Jaroslav: *See*—
Winn, Martin; Kyncl, Jaroslav; Dunnigan, Daniel Ambrose; and Jones, Peter Hadley, 4,112,097, Cl. 424-251.000.
L C Chemical Company Limited: *See*—
Nakamura, Kenji; and Seno, Iwao, 4,111,533, Cl. 350-337.000.
L. Schuler GmbH: *See*—
Dangelmaier, Karl, 4,111,086, Cl. 83-90.000.
La Bate, Micheal Donald. Sealing and filling material for metallurgical applications. 4,111,706, Cl. 106-44.000.
Labelette Company: *See*—
Wesley, John G., 4,111,737, Cl. 156-458.000.
LaBoda, Mitchell A., to General Motors Corporation. Method and apparatus for flow-through plating including pneumatic electrolyte shuttling system. 4,111,761, Cl. 204-26.000.

Laboratories Made, S.A.: *See—*
Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,111,945, Cl. 260-297.00R.

Labuda, Edward Franklin: *See—*
Bindell, Jeffrey Bruce; Holschwandner, Lowell Henry; Labuda, Edward Franklin; and Ryden, William Dennis, 4,111,783, Cl. 204-298.000.

Lacroix, Roger; and Haberli, Roland, to Ciba-Geigy Corporation. Stable concentrated liquid preparation of a paper dye of the copper phthalocyanine class. 4,111,650, Cl. 8-85.00R.

Lade, Robert W.: *See—*
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,112,458, Cl. 357-38.000.

Ladstatter, James A., to United States of America, Navy. Beamformer for wideband signals. 4,112,430, Cl. 343-100.00R.

LaFaver, Edward B. Apparatus and method for conserving water. 4,110,849, Cl. 137-435.000.

Lagemann, Gunther; and Heisterkamp, Wilhelm, to Krupp-Koppers GmbH. Method of and apparatus for heating up a chamber of a coking battery. 4,111,756, Cl. 201-41.000.

Lagus, Peter L.: *See—*
Flanagan, Brian S.; Turner, Phillip L.; Broce, Richard D.; and Lagus, Peter L., 4,112,302, Cl. 250-381.000.

Laird, Willy S.; and Kendall, Ben O., to Westinghouse Electric Corp. Grid braze application mold. 4,111,348, Cl. 228-181.000.

Lakomsky, Viktor Iosifovich; Sheiko, Ivan Vasilievich; Grigorenko, Georgy Mikhailovich; Torkhov, Gennady Fedorovich; Trigub, Vladimir Kirillovich; Korotkov, Albert Nikitovich; Kurganov, Viktor Mikhailovich; Moshkevich, Evgeny Isaevich; Pakhomov, Alexei Ivanovich; and Verkhovtsev, Emil Vasilievich. Plasmarc furnace for remelting metals and alloys. 4,112,246, Cl. 13-2.00P.

Lakshminarayanan, G. Raman: *See—*
Chen, Edward S.; Sadak, John C.; and Lakshminarayanan, G. Raman, 4,111,760, Cl. 204-26.000.

Lala, Louis A.: *See—*
Green, Melvin E.; Derrickson, Charles H.; and Lala, Louis A., 4,111,118, Cl. 101-123.000.

Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, to Ciba Geigy AG. Plasticized polymers of vinyl acetate. 4,111,888, Cl. 260-31.600.

Lambert, Gerard Lucien, to Johns-Manville Corporation. Packaging asbestos fibers. 4,111,113, Cl. 100-74.000.

Lampe, Donald R.; White, Marvin H.; and Jensen, Arthur S., to Westinghouse Electric Corp. Stabilized charge injector for charge coupled devices with means for increasing the speed of propagation of charge carriers. 4,112,456, Cl. 357-24.000.

Lampe, Donald Ross: *See—*
White, Marvin Hart; and Lampe, Donald Ross, 4,112,507, Cl. 365-184.000.

Lampman, John Edward. Container with tamperproof and stackable lid. 4,111,329, Cl. 220-266.000.

Lancaster, Patrick R.: *See—*
Lancaster, William G.; and Lancaster, Patrick R., 4,110,957, Cl. 53-589.000.

Lancaster, William G.; and Lancaster, Patrick R. Reverse wrap. 4,110,957, Cl. 53-589.000.

Landis, Joel Victor, to Petrolite Corporation. Electrofiltration of animal fats. 4,111,774, Cl. 204-186.000.

Lane, Stephen: *See—*
Porteous, Kenneth; Falkenberg, Leigh; and Lane, Stephen, 4,111,789, Cl. 208-11.0LE.

Lang, Otto: *See—*
Schuster, Friedrich; Thielemann, Max; and Lang, Otto, 4,110,962, Cl. 57-77.400.

Lang, Winfried; Schmidt, Dietrich; Hofer, Johann; Pachnek, Rudolf; and Rath, Heinz-Jorg, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for purifying halogenosilanes. 4,112,057, Cl. 423-342.000.

Lange, Heinz E.; and Ostlie, Dean A., to Minnesota Mining and Manufacturing Company. Latent, sensitizing ink. 4,111,462, Cl. 282-27.500.

Lange, Louis G., III; and Vallee, Bert L., to President and Fellows of Harvard College. Method of purifying alcohol dehydrogenase. 4,111,751, Cl. 195-66.00R.

Lange, Roger W.; and Sowman, Harold G., to Minnesota Mining and Manufacturing Company. Ultraviolet absorbing coatings. 4,112,186, Cl. 428-411.000.

Langemeier, Heinz: *See—*
Mayr, Ernst; and Langemeier, Heinz, 4,110,909, Cl. 33-126.70R.

Lanta, Jiri: *See—*
Bezstarosti, Ladislav; Lindental, Antonin; Lanta, Jiri; and Cizek, Jaroslav, 4,111,238, Cl. 139-436.000.

Lapeyre, James M., to Digicourse, Inc. Alphanumeric display system. 4,112,424, Cl. 340-336.000.

La Pointe, Roland. Log-splitting accessory for back hoe power equipment. 4,111,246, Cl. 144-193.00A.

Larker, Hans: *See—*
Adlerborn, Jan; and Larker, Hans, 4,112,143, Cl. 427-191.000.

Larkin, William A.; and Touval, Irving, to M&T Chemicals Inc. Flame retarding agents and polymer compositions containing same. 4,111,905, Cl. 260-45.75B.

Larsen, Donald Wayne, to W. R. Grace & Co. Use of latent amines to cure epoxy resins. 4,111,917, Cl. 528-45.000.

Larsen, Robert D.: *See—*
McCrary, Carl M.; and Larsen, Robert D., 4,111,245, Cl. 144-2.00Z.

Larson, Floyd Gotthard, Jr.; and deBarbadillo, John Joseph, II, to International Nickel Company, Inc., The. Crushable low reactivity nickel-base magnesium additive. 4,111,691, Cl. 75-170.000.

Larson, Gerald L.; and O'Neil, Walter K., to Eaton Corporation. Position detecting system. 4,112,365, Cl. 324-173.000.

Lasker, George, to General Dynamics Corporation. Armor. 4,111,097, Cl. 89-36.00A.

Lathrop Corporation of America, The: *See—*
Lathrop, George Edward, 4,111,425, Cl. 273-157.00R.

Lathrop, George Edward, to Lathrop Corporation of America, The. Jigsaw puzzle holder and display apparatus. 4,111,425, Cl. 273-157.00R.

Lathrop, James. Distributor cap and dust shield with hermetic sealing and moisture detection apparatus. 4,112,283, Cl. 200-302.000.

Lauterbach, Gary R.: *See—*
Ricciardi, Ronald J.; Ferrara, Angelo; Hartmann, Joseph L.; and Lauterbach, Gary R., 4,111,272, Cl. 177-50.000.

Lauzanne-Morelle, Eliane M. T.: *See—*
Morelle, Jean V.; and Lauzanne-Morelle, Eliane M. T., 4,112,085, Cl. 424-245.000.

Lavallee, Donald C.: *See—*
Palmer, James E.; Lavallee, Donald C.; and Huber, George, 4,112,401, Cl. 335-206.000.

Lavelle, Joseph E.; and Munroe, James L., to Jersey Nuclear-Avco Isotopes, Inc. Multi-dimensional corrective system for long radiation beams. 4,111,531, Cl. 350-293.000.

Lawrence, Geoffrey Lloyd, to Zenith Carburetter Company Limited, The. Spark ignition internal combustion engines. 4,111,169, Cl. 123-119.0EC.

Lawrence, Leslie John; and Ansbro, Denis, to Tioxide Group Limited. Production of calcinable material. 4,112,035, Cl. 264-113.000.

Lawton, William R., to Graphic Controls Corporation. Heat-sensitive coating composition with 4-aromatic and hydroxy substituted piperidine derivative and cyclic polyketo compound. 4,111,703, Cl. 106-21.000.

Layland, James W.: *See—*
United States of America, National Aeronautics and Space Administration; Layland, James W.; Martin, Warren L.; Zygielbaum, Arthur I.; Goldstein, Richard M.; and Hubbard, William P., 4,112,497, Cl. 364-728.000.

Lazar, Harvey A.: *See—*
Lindemann, Martin K. O.; and Lazar, Harvey A., 4,111,653, Cl. 8-161.000.

Lazarre, Flavien: *See—*
Bimond, Jean-Pierre; and Lazarre, Flavien, 4,111,829, Cl. 252-361.000.

Lazarus, Allan K.; and Knapp, Malcolm H., to Tenneco Chemicals, Inc. Lubricants for reciprocating compressors for oxygen-free gases. 4,111,821, Cl. 252-49.900.

Lazear, Nelson R., to Celanese Corporation. Polyester resin compositions which are photocurable in the presence of oxygen and an organic hydrazone polymerization initiator. 4,112,146, Cl. 427-54.000.

Lazovsky, Jury Iosifovich: *See—*
Rubashev, Grigory Markovich; Alperovich, Vladislav Ruvimovich; and Lazovsky, Jury Iosifovich, 4,112,348, Cl. 323-43.50S.

Lazzaretti, Louis G.: *See—*
Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, 4,110,889, Cl. 29-407.000.

League, John S., IV, to Koppers Company, Inc. Magnetic impulse rapper control system. 4,111,669, Cl. 55-112.000.

Lear Siegler, Inc.: *See—*
Bistrick, Eugene J.; Miller, Stewart F.; Abrahamsson, Axel B.; and Schlaf, Richard A., 4,111,586, Cl. 407-16.000.

Leary, John Joseph. Kite-controller. 4,111,387, Cl. 244-155.00A.

Leaver, Richard Hazen, to Koppers Company, Inc. Pellet mill die. 4,111,632, Cl. 425-382.00R.

Lebduska, John Lawrence, to Ecosol, Ltd. Energy conservation system. 4,111,259, Cl. 237-1.00A.

Leddy, James J.: *See—*
Heikel, Henrik R.; and Leddy, James J., 4,112,140, Cl. 427-126.000.

Leder, Frederic: *See—*
Sartori, Guido; and Leder, Frederic, 4,112,050, Cl. 423-223.000.
Sartori, Guido; and Leder, Frederic, 4,112,051, Cl. 423-223.000.
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Lee, Cheuk Man; and Zaugg, Harold Elmer, to Abbott Laboratories. 10-Amino-5H-[1]benzopyrano[4,3-c]pyridines. 4,111,942, Cl. 260-293.580.

Leeds & Northrup Company: *See—*
Baxter, Ronald Dale, 4,111,717, Cl. 136-225.000.

Leemann-Dittmann, Ruth. Apparatus for the display of information. 4,110,922, Cl. 40-447.000.

Leesona Corporation: *See—*
Cuff, David W., 4,112,039, Cl. 264-142.000.

Le Grelle, Guy Oscar, to Xaverius College. Electronic experimenting kit. 4,110,917, Cl. 35-19.00A.

Leiber, Heinz, to Robert Bosch GmbH. Hydraulic brake booster. 4,111,496, Cl. 303-92.000.

Leibrock, Kurt, to Saarbergwerke Aktiengesellschaft. Method of and an arrangement for making stable massive compacted coal charge bodies for use in a coking oven. 4,111,664, Cl. 44-10.00G.

Leichhardt, Harold A. Golf club carrier. 4,111,248, Cl. 150-1.50R.

Leigh, Arthur George; and Green, Robin John, to Lever Brothers Company. Bleaching assistants. 4,111,826, Cl. 252-89.00R.

Leininger, Larry W.: *See—*
Buckwalter, Mervin R.; Bulson, Walter T.; Leininger, Larry W.; Posipanko, Thomas; and Ray, Leonard N., Jr., 4,111,646, Cl. 8-2.50A.

Leive, Ernest W., to Square D Company. Terminal box for a lifting magnet. 4,112,248, Cl. 174-50.000.
Lemkey, Franklin David, to United Technologies Corporation. Directionally solidified eutectic superalloy articles. 4,111,723, Cl. 148-32.000.
Lender, Adam, to GTE Automatic Electric Laboratories Incorporated. Modified duobinary regenerative repeater testing arrangement. 4,112,263, Cl. 179-175.31R.
Lensel, Robert: *See*—
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Lenton, R. Warren: *See*—
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Lentz, Carl A.: *See*—
Harmon, Kenneth B.; Koenig, Richard J.; and Lentz, Carl A., 4,111,072, Cl. 74-864.000.
Leone, Richard P.: *See*—
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Leonhardt, Herta, administratrix: *See*—
Fuehrer, Werner; Huttel, Richard; Lisfeld, Robert; and Leonhardt, Karl, deceased, 4,111,530, Cl. 350-252.000.
Leonhardt, Karl, deceased: *See*—
Fuehrer, Werner; Huttel, Richard; Lisfeld, Robert; and Leonhardt, Karl, deceased, 4,111,530, Cl. 350-252.000.
L'Eplattenier, Francois; Pugin, Andre; and von der Crone, Jost, to Ciba-Geigy Corporation. Novel metal complexes of azomethines and process for their manufacture. 4,111,947, Cl. 260-299.000.
Leppich, Erhard, to Volkswagenwerk Aktiengesellschaft. Shock absorber valve. 4,111,231, Cl. 137-852.000.
Lerner, Edward; and Ventura, John A. Coffee brewer with means for dispensing controlled quantities of hot water. 4,111,337, Cl. 222-146.0HE.
Lerner, Melvin; and Ericson, Richard A., to United States of America, Customs Service. Apparatus for securing vapor samples. 4,111,049, Cl. 73-421.50R.
Les Produits Associes LPA S.A.: *See*—
Jousson, Pierre J., 4,111,193, Cl. 128-66.000.
Leuenberger, Roland. Process for drilling holes in hard materials, in surgical procedures, and apparatus for carrying out the process. 4,111,208, Cl. 128-305.100.
Leutenegger, Willi: *See*—
Zurbuchen, Jacques; Leutenegger, Willi; and Calcaterra, Luigi, 4,111,645, Cl. 8-1.00W.
Levensalor, George W., to Great Northern Nekoosa Corporation. Barrier coat for groundwood carbonless coated paper. 4,111,461, Cl. 282-27.500.
Lever Brothers Company: *See*—
Eymond, Philip Richard Norman, 4,112,226, Cl. 542-461.000.
Jorgensen, Arne; Berthelsen, Poul; and Bassoe, Jorgen, 4,111,352, Cl. 229-31.00R.
Leigh, Arthur George; and Green, Robin John, 4,111,826, Cl. 252-89.00R.
Lewin, Ian: *See*—
Small, Edward A., Jr.; and Lewin, Ian, 4,112,483, Cl. 362-298.000.
Leworthy, John Harwood, to General Electric Company Limited, The. Fall-through return spring arrangement for a push-button switch mechanism. 4,112,284, Cl. 200-340.000.
Libbey-Owens-Ford Company: *See*—
Motter, Theodore J.; Mattimoe, Paul T.; and Bartus, Stephen P., Jr., 4,112,171, Cl. 428-213.000.
Lichti, Robert D. Passenger loading ramp. 4,110,859, Cl. 14-71.500.
Liebler, Jerome E., to Omnitext, Inc. Multi-terminal serially communicating shared logic text editing system. 4,112,252, Cl. 178-58.00R.
Liesveld, Daniel J. Method and apparatus for channel cutting of hard materials using high velocity fluid jets. 4,111,490, Cl. 299-17.000.
Life Savers, Inc.: *See*—
Hussein, Ma'moun M., 4,112,066, Cl. 424-48.000.
Life Sciences, Inc.: *See*—
Bugay, Al, 4,112,491, Cl. 364-415.000.
Lim, Gary M. F.: *See*—
Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., 4,112,230, Cl. 544-105.000.
Limbach, Paul; and Socha, Paul, to H. Waterbury & Sons Company. Apparatus for producing papermaker's felt. 4,111,634, Cl. 425-505.000.
Limon, Robert James: *See*—
Lindner, Robert Arthur; and Limon, Robert James, 4,111,886, Cl. 260-31.80T.
Lin, Chii-Fa; and Blanch, Julian E., to Stauffer Chemical Company. Removal of trace heavy metal contaminants from algae and the carrageenan contained therein. 4,112,223, Cl. 536-114.000.
Lin, Chiu-Hong, to Upjohn Company, The. 5,6-Didehydro-ω-phenoxy-PGE$_2$ analogs. 4,111,969, Cl. 260-410.90R.
Lin, Victor J., to Celanese Corporation. Heated spray spinning nozzle and attenuation system. 4,111,620, Cl. 425-66.000.
Lindberg, Jarl Johan: *See*—
Dolk, Matti; Era, Vaino; and Lindberg, Jarl Johan, 4,112,152, Cl. 427-385.00R.
Lindemann, Martin K. O.; and Lazar, Harvey A., to Gillette Company, The. Alkali stannite depilatories. 4,111,653, Cl. 8-161.000.
Lindental, Antonin: *See*—
Bezstarosti, Ladislav; Lindental, Antonin; Lanta, Jiri; and Cizek, Jaroslav, 4,111,238, Cl. 139-436.000.
Lindner, Robert Arthur; and Limon, Robert James, to Henkel Inc. Plastics compositions with higher alcohol esters as lubricants and release agents. 4,111,886, Cl. 260-31.80T.
Lingl Corporation: *See*—
Lingl, Hans, 4,112,033, Cl. 264-44.000.
Lingl, Hans, to Lingl Corporation. Method of using sludge for making ceramic articles. 4,112,033, Cl. 264-44.000.
Linke, Horst: *See*—
Beckmann, Klaus; and Linke, Horst, 4,111,489, Cl. 299-34.000.
Linn, Wallace Leon. Appliance timer with contact mounting for flexible contacts. 4,112,266, Cl. 200-38.00C.
Lins, Stanley James, to Sperry Rand Corporation. Stripe domain propagation using contiguous bicore disk file structure. 4,112,503, Cl. 365-29.000.
Lipo, Thomas A., to General Electric Company. Measurement of pulsating torque in a current source inverter motor drive. 4,112,339, Cl. 318-227.000.
Lisfeld, Robert: *See*—
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Little, David Murray: *See*—
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Cranston, Dale O., 4,110,908, Cl. 32-50.000.
Stager, Francis W., 4,111,407, Cl. 267-166.000.
Liu, James, to Baumgartner, Franklin. Method of storing hydrogen. 4,111,689, Cl. 75-122.000.
Livermore, Stephen F., to United States of America, National Aeronautics and Space Administration. Lighting current detector. 4,112,357, Cl. 324-72.000.
Livesay, J. D., to General Motors Corporation. Press-on plastic baffle for accumulator-dehydrator. 4,111,005, Cl. 62-503.000.
Llewellyn, Rees Jenkin: *See*—
Bangay, Alan John; Raw, Peter Michael; Llewellyn, Rees Jenkin; and Gregory, Peter, 4,110,892, Cl. 29-420.000.
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Lockheed Aircraft Corporation: *See*—
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Lockheed Corporation: *See*—
Gibson, Harry S., Jr.; and Trevillion, Charlie Gene, 4,112,355, Cl. 324-57.00R.
Johnson, George William, 4,111,085, Cl. 83-1.000.
Login, Robert Bernard, to BASF Wyandotte Corporation. Phosphorus-containing polyester and size compositions. 4,111,816, Cl. 252-8.600.
Long, Dennis James George, to BP Chemicals Limited. Preservation process. 4,112,122, Cl. 426-19.000.
Long, Robert L.: *See*—
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Longfoot, Gerald, to Wellworthy Limited. Sealing ring assemblies for pistons. 4,111,438, Cl. 277-148.000.
Lonseth, Palmer; Panter, Hubert Gerald; and Moorby, Donald G., to Canadian General Electric Company. Corona inhibition in dynamo-electric machines. 4,110,900, Cl. 29-596.000.
Lonseth, Palmer; Panter, Hubert Gerald; and Moorby, Donald G., to Canadian General Electric Company. Method for reducing corona in dynamoelectric machines. 4,112,041, Cl. 264-263.000.
Look, Robert A. Ski lock. 4,111,015, Cl. 70-58.000.
Loos, John H., to General Motors Corporation. Room air conditioner door operating mechanism. 4,111,001, Cl. 62-427.000.
Lord Corporation: *See*—
Howard, Dennis D., 4,112,017, Cl. 260-359.00R.
L'Oreal: *See*—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,112,229, Cl. 544-105.000.
Loshaek, Samuel; and Shen, Chah M., to Wesley-Jessen Inc. Gas-permeable lens. 4,111,535, Cl. 351-160.000.
Louboutin, Robert, to Societe Degremont. Water treatment apparatus and method. 4,111,802, Cl. 210-46.000.
Louch, James B.: *See*—
Postman, William; Louch, James B.; and Buchert, Hermann, 4,111,818, Cl. 252-8.900.
Louineau, Andre Jean-Francois: *See*—
Gautier, Christian Jean; Marti, Bernard; Mauduit, Michel Robert; Louineau, Andre Jean-Francois; and Schwartz nee Luneau, Christiane, 4,112,459, Cl. 358-6.000.
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Louther, William P., Jr., to AFP Corporation. Split back furniture article and method of assembly. 4,110,946, Cl. 52-223.00R.
Love, Francis Lee. Knock-down workpiece-supporting standard and overspray shield. 4,111,408, Cl. 269-289.00R.
Lowe Paper Company: *See*—
Garner, Lynn Thomas, 4,112,038, Cl. 264-138.000.
Lowell Corporation: *See*—
Cummings, Henry S.; and Leone, Richard P., 4,111,077, Cl. 81-63.000.
Lucas, Bernard, to Padeg A.G. Cartridge having individual isolated cells. 4,111,304, Cl. 206-534.000.
Lucas Industries Limited: *See*—
Skinner, Robert Thomas John, 4,111,173, Cl. 123-139.0AQ.
Lucifer S.A.: *See*—
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Lucotte, Gerard: *See—*
Truffier, Jean-Claude; Lucotte, Gerard; and Cordonnier, Raymond, 4,112,074, Cl. 424-177.000.
Luke, George Michael: *See—*
Crenshaw, Ronnie Ray; and Luke, George Michael, 4,112,234, Cl. 548-342.000.
Lummus Company, The: *See—*
Knigge, Heinz Friedrich, 4,111,814, Cl. 210-323.00T.
Lundh, Roy Walfrid, to Poseidon Marketing and Development Co. Marine pipeline. 4,110,994, Cl. 405-158.000.
Luscher, Rene, to Gretag Aktiengesellschaft. Cassette for strip material. 4,111,379, Cl. 242-71.100.
Lutz, David Edward. Loading and unloading apparatus for vehicles. 4,111,318, Cl. 214-83.220.
Lyass, Abram Moiseevich: *See—*
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Lysogorsky, Gennady Tikhonovich: *See—*
Buzhinsky, Vladimir Lukyanovich; Raschepkin, Konstantin Egorovich; Dunjushkin, Mikhail Grigorievich; Lysogorsky, Gennady Tikhonovich; Valeev, Rustem Ibragimovich; Nisenbaum, Yakov Arkadievich; and Ikhsanov, Deviz Faizrakhmanovich, 4,110,862, Cl. 15-88.000.
Lytle, John David; and Combs, James M., to United States of America, Army. Triaxial deflection meter. 4,110,912, Cl. 33-312.000.
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Larkin, William A.; and Touval, Irving, 4,111,905, Cl. 260-45.75B.
Mabuchi, Kenichi; and Komatsu, Kogiro, to Mabuchi Motor Co., Ltd. Power source unit. 4,112,201, Cl. 429-62.000.
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Mabuchi, Kenichi; and Komatsu, Kogiro, 4,112,201, Cl. 429-62.000.
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Maccalous, Joseph W.; and Thomas, Donald A. Method of coating with ablative heat shield materials. 4,112,179, Cl. 428-325.000.
MacDonald, Archie T. Spare tire and wheel securing device. 4,111,344, Cl. 224-42.240.
Mackaness, James B. Commodity conveying means. 4,111,374, Cl. 241-101.700.
Mackiernan, Stuart W., to BesPak Corporation. Paperboard carton. 4,111,351, Cl. 229-17.00M.
MacMillan, Kenneth T. Process of and molds for applying precured rubber tires and other objects. 4,111,732, Cl. 156-96.000.
Mader, Siegfried R.; Masters, Burton J.; and Pogge, H. Bernhard, to International Business Machines Corporation. Minimization of misfit dislocations in silicon by double implantation of arsenic and germanium. 4,111,719, Cl. 148-1.500.
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Davis, Donald Colen; Bilger, Alan H.; and Madson, Kent Christ, Jr., 4,111,778, Cl. 204-195.00S.
Maeda, Keisuke; and Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Cameras with electrically controlled exposure for use with electronic flash device. 4,112,442, Cl. 354-31.000.
Maeda, Yoji: *See—*
Ito, Katsuo; Murata, Bunjiro; Maeda, Yoji; and Hibino, Eiichi, 4,112,378, Cl. 325-464.000.
Maehr, Hubert, to Hoffmann-La Roche Inc. Conversion of mocimycin to antibiotic X-5108 and intermediates. 4,112,216, Cl. 536-1.000.
Magnat Corp.: *See—*
Mengel, William Rudolph, 4,111,569, Cl. 403-5.000.
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Mierzwinski, Eugene P., 4,111,421, Cl. 273-85.00G.
Magyar, Joseph J., to General Motors Corporation. Seat belt utilization recorder. 4,111,459, Cl. 280-744.000.
Mahan, John E.: *See—*
Fahey, Darryl R.; and Mahan, John E., 4,111,972, Cl. 260-439.00R.
Mahlein, Hans F.: *See—*
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Mahoney, Gerard Edward: *See—*
Cho, Alfred Yi; DiLorenzo, James Vincent; and Mahoney, Gerard Edward, 4,111,725, Cl. 148-175.000.
Maier, Adolph J., Jr. Thermal insulating clips for metal insulated walls and roofs. 4,110,948, Cl. 52-402.000.
Maier, Edward E.: *See—*
Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,111,759, Cl. 203-7.000.
Mailloux, Louis D.; and Bollman, James E., to Xerox Corporation. Collating system for opaque documents and slide reproductions. 4,111,542, Cl. 355-14.000.
Mainka, Christian M., to Morse Boulger, Inc. Bearing assembly for a stoker carriage. 4,111,134, Cl. 110-328.000.
Mainz, Franz, to Gerresheimer Glas Aktiengesellschaft. Insulating double glass pane. 4,110,950, Cl. 52-518.000.
Malinowski, William J., to Chloride, Incorporated. Smoke detector with photo-responsive means for increasing the sensitivity during darkness. 4,112,310, Cl. 250-574.000.
Mallard, Robert G., to Bob Mallard Enterprises, Inc. Loom drive mechanism. 4,111,240, Cl. 139-449.000.
Mallinckrodt, Inc.: *See—*
Chapman, Douglas W.; and Bertsch, Hugh C., 4,112,238, Cl. 560-70.000.
Margherita, Salvatore S., 4,111,656, Cl. 23-230.60J.
Maness, John F., to Cricket Corporation. Insect bait dispensing device. 4,110,931, Cl. 43-55.000.
Maness, Roy F., to Exxon Nuclear Company, Inc. Inhibiting corrosion of stainless steel by ruthenium-containing nitric acid solution. 4,111,831, Cl. 422-12.000.
Manfredi, John L., to Moore & White Company, The. Adjustable bearing assembly for web decurling apparatus. 4,111,745, Cl. 162-271.000.
Mangum, Norman W., Jr.; and Ripy, Howard W., to United Technologies Corporation. Digital transient discriminator with noise spike clipping. 4,112,499, Cl. 364-732.000.
Mania, Dieter: *See—*
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Mannesmann Aktiengesellschaft: *See—*
Torkuhl, Joachim, 4,110,991, Cl. 405-157.000.
Mansfield, John Rickard, to Imperial Chemical Industries Limited. Analytical apparatus and processes. 4,111,776, Cl. 204-195.00T.
MAR-PHA, Societe d'Etude et d'Exploitation de Marques: *See—*
Mardiguian, Jean, 4,112,000, Cl. 568-734.000.
Marchaj, Tadeusz J., to Preload Technology, Inc. System for storing liquified gas. 4,110,995, Cl. 62-50.000.
Marchetti, Michael John, to Sperry Rand Corporation. Counter device associated with switch actuator of electrical shaver to determine battery recharging and use. 4,112,271, Cl. 200-52.00R.
Marcilly, Christian, to Institut Francais du Petrole. Process for alkylation-transalkylation of aromatic hydrocarbons by means of methanol. 4,112,008, Cl. 260-671.00M.
Marconi Instruments Limited: *See—*
Clarke, Graham John, 4,112,340, Cl. 318-331.000.
Marcus, Emanuel J. Game in the form of a miniature mine containing a precious gem. 4,111,413, Cl. 272-1.00R.
Mardiguian, Jean, to MAR-PHA, Societe d'Etude et d'Exploitation de Marques. Terpenophenols. 4,112,000, Cl. 568-734.000.
Maret, Arthur R., to Xerox Corporation. Ultrasonic cleaning apparatus for an electrostatographic reproducing machine. 4,111,546, Cl. 355-15.000.
Margherita, Salvatore S., to Mallinckrodt, Inc. Radioimmunoassay methods for the determination of L-triiodothyronine and thyroxine. 4,111,656, Cl. 23-230.600.
Margres, Jack J.: *See—*
Rubino, Andrew M.; and Margres, Jack J., 4,112,072, Cl. 424-155.000.
Marien, Bruce Arthur; and Kaufman, Paul Richard, to Borg-Warner Corporation. Nitrile resins stabilized against discoloration and method for producing the same. 4,112,022, Cl. 260-881.000.
Mark, Victor; and Wilson, Phillip Steven, to General Electric Company. Plasticized polycarbonate composition. 4,111,883, Cl. 260-30.60R.
Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,111,977, Cl. 260-45.95R.
Markow, Edward G., to Grumman Aerospace Corporation. Band reinforced radial tire. 4,111,249, Cl. 152-330.0RF.
Markus, Franklyn M.: *See—*
Jones, William C., 4,111,482, Cl. 297-159.000.
Marley Company, The: *See—*
Cates, Robert E., 4,112,027, Cl. 261-151.000.
Mars Limited: *See—*
Compton, Peter Arnold, 4,111,303, Cl. 206-520.000.
Marshall, George E., Jr.: *See—*
Freeman, Daniel L.; Bettencourt, Darryl G.; and Marshall, George E., Jr., 4,111,210, Cl. 130-30.00R.
Martel, Jacques; and Tessier, Jean, to Roussel Uclaf. Preparation of optically active allethrolone. 4,111,994, Cl. 260-586.00R.
Marti, Bernard: *See—*
Gautier, Christian Jean; Marti, Bernard; Mauduit, Michel Robert; Louineau, Andre Jean-Francois; and Schwartz nee Luneau, Christiane, 4,112,459, Cl. 358-6.000.
Martin, Charles W.: *See—*
Bozzelli, John W.; Shier, George D.; Pearce, Roscoe L.; and Martin, Charles W., 4,112,049, Cl. 423-226.000.
Martin, John C.; and Martin, Paul H., to Diesel Equipment Limited. Dump truck with telescoping container body. 4,111,485, Cl. 298-1.00B.
Martin, Manfred; Schmidt, Walter; and Scharfe, Gerhard, to Bayer Aktiengesellschaft. Silicon containing catalysts. 4,111,967, Cl. 260-396.00R.
Martin Marietta Corporation: *See—*
Wade, Jackie F.; Peyton, John E.; Klitzky, Bruce R.; and Groff, Roy E., 4,111,762, Cl. 204-33.000.
Martin, Paul H.: *See—*
Martin, John C.; and Martin, Paul H., 4,111,485, Cl. 298-1.00B.
Martin, Thomas B.; and Pieters, Ferdinandus A., to Micropump Corporation. Magnetically coupled gear pump construction. 4,111,614, Cl. 417-420.000.
Martin, Warren L.: *See—*
United States of America, National Aeronautics and Space Administration; Layland, James W.; Martin, Warren L.; Zygielbaum, Arthur I.; Goldstein, Richard M.; and Hubbard, William P., 4,112,497, Cl. 364-728.000.
Maruzen Sewing Machine Co., Ltd.: *See—*
Kohara, Tadao, 4,111,503, Cl. 312-27.000.
Marx, Alvin J.; and Edelman, Abraham, to Marx, Alvin J. Automated intravenous fluid regulating and administering apparatus. 4,111,198, Cl. 128-214.00E.

Masaki, Kenji: *See*—
Nakajima, Masao; Masaki, Kenji; and Inoue, Mitsumasa, 4,111,170, Cl. 123-119.0EC.

Mascaro, Thomas C. Module and modular support for turfgrass and like areas. 4,111,585, Cl. 404-70.000.

Mascher, Werner. Air-regeneration filter. 4,112,048, Cl. 423-210.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Regar, Karl-Nikolaus, 4,110,982, Cl. 60-413.000.
Willeitner, Eberhard, 4,111,123, Cl. 101-407.00A.

Mascia, Carmen T.; and Hasegawa, Gary K., to Continental Group, Inc., The. Reusable can carrier strip. 4,111,298, Cl. 206-151.000.

Masotti, Robert; Biola, Georges; and Guerpillon, Henri, to Rhone-Poulenc Industries. Arrangement for preparing alkylaluminums. 4,111,662, Cl. 422-231.000.

Masson Scott Thrissell Engineering Ltd.: *See*—
Graves, Bernard Albert; and Mockett, John Edward, 4,111,411, Cl. 271-199.000.

Masters, Burton J.: *See*—
Mader, Siegfried R.; Masters, Burton J.; and Pogge, H. Bernhard, 4,111,719, Cl. 148-1.500.

Mastromatteo, Michael. Control devices. 4,111,056, Cl. 73-706.000.

Masuda, Akira: *See*—
Norimatsu, Hideaki; Kobayashi, Akio; Masuda, Akira; and Kitajima, Sigenori, 4,111,162, Cl. 123-32.0EE.

Masuda, Joji; and Moriya, Makoto, to Nissan Motor Company, Limited. Compact cab-over equipped with a cooler condenser. 4,111,275, Cl. 180-68.00R.

Materials Technology Corporation: *See*—
Fonzi, Frank, 4,112,148, Cl. 427-248.00C.

Mather, Douglas Edward: *See*—
Cussons, Frank Michael; Mather, Douglas Edward; and Williams, Thomas Alan, 4,112,118, Cl. 423-313.000.

Mathers, James Evan: *See*—
Chenot, Charles Frederic; Mathers, James Evan; and Shaffer, Francis Nathan, 4,112,194, Cl. 428-539.000.

Mathues, Thomas P.: *See*—
Gordon, Ralph A.; Mathues, Thomas P.; and Parker, Donald L., 4,110,985, Cl. 60-548.000.

Matikainen, Martti; and Sivonen, Matti, to Valmet Oy. Roll and roll-driving assembly. 4,111,065, Cl. 74-410.000.

Matsui, Sadayoshi: *See*—
Mori, Kogoro; Izawa, Taro; Mizuno, Yoshifumi; and Matsui, Sadayoshi, 4,111,879, Cl. 260-29.60N.

Matsumoto, Yukimichi; and Ueyama, Minoru, to Kabushiki Kaisha Fuji Tekkosho. Lug end cutting apparatus for roll-like products. 4,111,084, Cl. 82-48.000.

Matsumura, Osamu: *See*—
Funazawa, Masakazu; and Matsumura, Osamu, 4,110,970, Cl. 58-90.00R.

Matsuo, Masujiro: *See*—
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo; Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, 4,112,260, Cl. 179-18.0FC.

Matsushita Electric Industrial Company Limited: *See*—
Mifune, Hideo; Tani, Kenroku; and Noguchi, Toyota, 4,112,420, Cl. 340-550.000.
Watanabe, Iwao, 4,111,615, Cl. 417-423.00A.

Matsushita Electric Works, Ltd.: *See*—
Kameyama, Yasuyoshi; and Suzaki, Satoru, 4,112,407, Cl. 337-398.000.
Nakamura, Yoshimitsu; and Kojima, Hajime, 4,110,901, Cl. 29-598.000.

Matsuura, Kazuo: *See*—
Okada, Motohiro; Oka, Katsumi; Honda, Kiyoshi; and Matsuura, Kazuo, 4,111,458, Cl. 280-739.000.

Matsuyoshi, Hideaki; Mori, Kazushige; and Shimono, Yukio, to Kubota, Ltd. Apparatus for loading and unloading a working machine to and from main equipment. 4,111,319, Cl. 214-131.00A.

Matsuzawa, Hideo: *See*—
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Yamada, Kantaro, 4,111,984, Cl. 562-538.000.
Okada, Kazuya; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,111,985, Cl. 562-546.000.

Matthews, Russell Byron, to Johnson Controls, Inc. Proven pilot fuel ignition system with sampling flame sensor. 4,111,639, Cl. 431-25.000.

Mattimoe, Paul T.: *See*—
Motter, Theodore J.; Mattimoe, Paul T.; and Bartus, Stephen P., Jr., 4,112,171, Cl. 428-213.000.

Matumoto, Hiromi: *See*—
Nakajima, Koe; and Matumoto, Hiromi, 4,111,025, Cl. 72-164.000.

Mauch, David L., to Commercial Shearing, Inc. Thrust rings for swash plate pumps and motors. 4,111,103, Cl. 92-57.000.

Mauduit, Michel Robert: *See*—
Gautier, Christian Jean; Marti, Bernard; Mauduit, Michel Robert; Louineau, Andre Jean-Francois; and Schwartz nee Luneau, Christiane, 4,112,459, Cl. 358-6.000.

Maugans, Terrance W.: *See*—
Arakelian, Edward M.; and Maugans, Terrance W., 4,112,273, Cl. 200-67.00D.

Maurer, Fritz: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammen, Ingeborg; and Homeyer, Bernhard, 4,112,080, Cl. 424-200.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,112,081, Cl. 424-200.000.

Max Weishaupt GmbH: *See*—
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Mayer, Robert William: *See*—
Bantz, Paul Edward; and Mayer, Robert William, 4,111,256, Cl. 164-335.000.

Mayer, Steven T.; and Milner, Ronald E., to Atari, Inc. Method and apparatus for generating moving objects on a video display screen. 4,112,422, Cl. 340-324.0AD.

Mayr, Ernst; and Langemeier, Heinz. Device for cleaning oil dipsticks. 4,110,909, Cl. 33-126.70R.

Mazour, Zdenek; and Dayer, Francis Louis, to Ciba-Geigy Corporation. Process for the production of alkoxy-β-halogenoethylsilanes. 4,111,974, Cl. 260-448.80R.

Mazoyer, Jean, to Beaulieu. Automatic device for positioning the tone arm of a record player. 4,111,432, Cl. 274-15.00R.

McAllister, William D.; and Rajczi, Frank D., to Schatz Federal Bearings Co., Inc. Method and apparatus for installing a bearing shield or seal into the annular space of a bearing. 4,110,883, Cl. 29-148.40S.

McCarty, Leslie P.: *See*—
Tomalia, Donald A.; Dickert, Yancey J.; and McCarty, Leslie P., 4,112,067, Cl. 424-78.000.

McCarty, Stuart Wayne; and O'Shields, Clarence Morris, to Olin Corporation. Method for obtaining uniform porosity in printed inherently porous cigarette tipping papers. 4,112,154, Cl. 427-401.000.

McClelland, Donald H.: *See*—
Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, 4,112,202, Cl. 429-94.000.

McClelland, Robert David: *See*—
Baird, David Boyd; Campbell, James Stanley; Fishwick, Brian Ribbons; and McClelland, Robert David, 4,111,956, Cl. 260-329.0AM.

McCloskey, Albert R., to Heim Universal Corporation, The. Bearing assembly and liner. 4,111,499, Cl. 308-72.000.

McClung, Carl L.: *See*—
Alstrin, Charles E.; McClung, Carl L.; and Smith, James C., 4,111,166, Cl. 123-97.00B.

McClure, Charles A. Flow monitoring. 4,111,044, Cl. 73-215.000.

McClurg, William E.; and Partridge, Charles C., to ACF Industries, Incorporated. Ball valve seat assembly having a removably mounted face seal insert. 4,111,393, Cl. 251-174.000.

McConnell, Bobby Lee; Thornton, Raymond; and Graham, Louis Atkins, to Burlington Industries, Inc. Reactive dyeing systems using dyes with carboxylic acid groups. 4,111,648, Cl. 8-30.000.

McConnell, Richard L.; and Weemes, Doyle A., to Eastman Kodak Company. Peroxide treated substantially amorphous polyolefins useful as pressure-sensitive adhesives. 4,112,208, Cl. 526-57.000.

McCormick, Donald Hugh; and Perkins, William Weldon. Self-latching yoke gate latch. 4,111,475, Cl. 292-216.000.

McCrary, Carl M.; and Larsen, Robert D., to Weyerhaeuser Company, by said Carl M. McCrary. Tree delimber. 4,111,245, Cl. 144-2.00Z.

McCully, Everette Ray: *See*—
Hauke, Francis Edward; McCully, Everette Ray; McElroy, Robert Marion, Jr.; Stevenson, Peter Alan; Vogel, Stephen Martin; and Woods, John Walton, 4,112,472, Cl. 360-102.000.

McDermid, Terry: *See*—
Sherman, Clarence A., 4,110,983, Cl. 60-477.000.

McDowell, Donald J.: *See*—
Brady, John F.; and McDowell, Donald J., 4,111,583, Cl. 404-69.000.

McDowell-Wellman Engineering Company: *See*—
Ban, Thomas E.; and Rao, Ashok D., 4,111,755, Cl. 201-6.000.

McElroy, Robert Marion, Jr.: *See*—
Hauke, Francis Edward; McCully, Everette Ray; McElroy, Robert Marion, Jr.; Stevenson, Peter Alan; Vogel, Stephen Martin; and Woods, John Walton, 4,112,472, Cl. 360-102.000.

McFadden, Buryl L., to United States of America, Air Force. Separable coupling for plural pressure lines. 4,111,463, Cl. 285-25.000.

McGalliard, James D. Fluid sensitive switching member. 4,112,312, Cl. 307-118.000.

McGibbon, William: *See*—
Nutter, Geoffrey; and McGibbon, William, 4,112,487, Cl. 364-200.000.

McKay, Dwight L. Cracking catalyst modified by antimony thiophosphate. 4,111,845, Cl. 252-455.00Z.

McKinney Manufacturing Company: *See*—
Gwozdz, Joseph W., 4,110,867, Cl. 16-82.000.

McLafferty, George H., to United Technologies Corporation. Aerodynamic window method and apparatus. 4,112,388, Cl. 331-94.50D.

McNeice, Donald: *See*—
Kolombos, Alexander John; McNeice, Donald; and Wood, Dennis Charles, 4,111,793, Cl. 208-121.000.

McNeil Laboratories, Incorporated: *See*—
Carson, John Robert; Carmosin, Richard J.; and Stefanski, Anthony T., 4,111,954, Cl. 260-326.620.

McRae, Russell C., to ILC Technology, Inc. Battery terminal seal structure. 4,112,204, Cl. 429-181.000.

Mead Corporation, The: *See*—
Cone, Donald Roy, 4,112,436, Cl. 346-140.00R.
Culpepper, Will Lester; and Cooley, Jack Seabron, 4,111,105, Cl. 93-37.0SP.
Davis, Gerald Titus; and Shackle, Dale Richard, 4,112,138, Cl. 427-54.000.
Paranjpe, Suresh C.; and Burnett, James E., 4,112,469, Cl. 358-296.000.

Mead, Kenneth W.; and Peters, K. Stewart, to Carpenter Technology Corporation. Welding apparatus. 4,112,289, Cl. 219-124.330.

Meadus, Frederick W.; Sparks, Bryan D.; and Puddington, Ira E., to Canadian Patents and Development Limited. Transparent pressure-sensitive coatings. 4,111,874, Cl. 260-23.00R.

Mechling, Charles H.; Niedermier, James B.; and Steber, Norman J., to PPG Industries, Inc. Adaptation of glass shaping means for tempering flat glass. 4,111,676, Cl. 65-114.000.

Mecklenborg, Richard A., to Singer Company, The. Infinity image display having increased vertical field of view. 4,112,462, Cl. 358-104.000.

Meguro, Satoshi: *See—*
Nagasawa, Kouichi; Kosa, Yasunobu; and Meguro, Satoshi, 4,110,899, Cl. 29-571.000.

Mei, Viung C.: *See—*
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Meier, Rene: *See—*
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Meiller, Francois, to Rhone-Poulenc Industries. Modified mineral supports. 4,112,185, Cl. 428-403.000.

Melliger, Guido W., to Dierks & Sohne Maschinenfabrik, Firma. Granulation process. 4,111,371, Cl. 241-18.000.

Melly, Jeffrey P.: *See—*
Wrob, Ronald M.; and Melly, Jeffrey P., 4,112,410, Cl. 338-243.000.

Meltzer, David W., to Xerox Corporation. Vibrating blade cleaner. 4,111,545, Cl. 355-15.000.

Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., to Bristol-Myers Company. $\Delta^{2,3}$-1,4 Morpholine-2-carboxylic acid derivatives as antibacterial agents. 4,112,230, Cl. 544-105.000.

Mendenhall, Geoffrey N., to Harris Corporation. Automatic phase controlled pilot signal generator. 4,112,259, Cl. 179-15.0BT.

Meng, Ilse Heide Frieda, legal representative: *See—*
Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,112,109, Cl. 424-273.00P.

Meng, Karl: *See—*
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,112,227, Cl. 424-273.00P.

Meng, Karl, deceased: *See—*
Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,112,109, Cl. 424-273.00P.

Mengel, William Rudolph, to Magnat Corp. Shell and shaft subassembly. 4,111,569, Cl. 403-5.000.

Menzel, Klaus Rudolf: *See—*
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Merck & Co., Inc.: *See—*
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Kao, Henry S.; Sklarz, William A.; and Weinstock, Leonard M., 4,111,948, Cl. 260-302.00R.
Novello, Frederick C.; and Baldwin, John J., 4,111,944, Cl. 260-296.00R.
Rooney, Clarence Stanley; Rokach, Joshua; and Atkinson, Joseph George, 4,112,112, Cl. 424-274.000.

Merendino, Michael J.: *See—*
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Merkel, Wulf: *See—*
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Merten, Rudolf: *See—*
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Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Thomanek, Franz Rudolf, 4,111,126, Cl. 102-52.000.

Messier, Russell F.: *See—*
Wolfe, Robert W.; and Messier, Russell F., 4,112,328, Cl. 313-486.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Reh, Lothar; Hirsch, Martin; and Plass, Ludolf, 4,111,158, Cl. 122-4.00D.
Steinberg, Friedhelm; and Voss, Gunter, 4,111,704, Cl. 106-25.000.

Metz, W. Peter. Manufacture of improved electrical contact materials. 4,112,197, Cl. 428-629.000.

Meussdoerffer, Johann-Nikolaus: *See—*
Niederprum, Hans; Meussdoerffer, Johann-Nikolaus; Nieder-Vahrenholz, Hans-George; and Bockelmann, Wolfgang, 4,112,046, Cl. 423-53.000.

Meybeck, Jacques, to Sandoz Ltd. Monoazo dyes having an aryloxyalkyl group on the nitrogen atom in the para position of a 1,4-phenylene coupling component radical. 4,111,930, Cl. 260-207.500.

Meyer, Jeffrey G., to Anderson Development Company. Nickel bis-organo-orthosphosphate combination catalyst. 4,111,839, Cl. 252-431.00P.

MFE Corporation: *See—*
Burke, Edward F., Jr., 4,110,879, Cl. 29-25.420.

Miale, Joseph Nicolas: *See—*
Chen, Nai Yuen; Miale, Joseph Nicolas; and Reagan, William Joseph, 4,112,056, Cl. 423-329.000.

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Martin, Thomas B.; and Pieters, Ferdinandus A., 4,111,614, Cl. 417-420.000.

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Johnson, Reynold B., 4,111,430, Cl. 274-9.00B.

Midland-Ross Corporation: *See—*
Zanow, Andrey L., 4,111,406, Cl. 267-153.000.

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Mierzwinski, Eugene P., to Magnavox Company, The. Optical linked remote control video game apparatus. 4,111,421, Cl. 273-85.00G.

Mifune, Hideo; Tani, Kenroku; and Noguchi, Toyota, to Matsushita Electric Industrial Company Limited. Apparatus for detecting the breakage of an acoustically conductive medium. 4,112,420, Cl. 340-550.000.

Miga, Christian John: *See—*
Duensing, Willard John; and Miga, Christian John, 4,112,129, Cl. 426-417.000.

Mihara, Toshihide: *See—*
Yamaoka, Kojiro; Mihara, Toshihide; and Tanaka, Akira, 4,110,898, Cl. 29-568.000.

Mikes, Otakar: *See—*
Strop, Petr; Coupek, Jiri; and Mikes, Otakar, 4,111,859, Cl. 521-33.000.

Mikoshiba, Hitoshi: *See—*
Tezuka, Chikao; and Mikoshiba, Hitoshi, 4,111,117, Cl. 101-93.280.

Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, to Ciba-Geigy Corporation. Novel compositions of matter for use in the treatment of aqueous systems. 4,111,804, Cl. 210-58.000.

Millar, Frederick William: *See—*
Varvel, David Anthony; Millar, Frederick William; and Farquharson, Stuart Connall, 4,112,292, Cl. 235-449.000.

Miller, Brian J.: *See—*
Jacobson, Ronald H.; and Miller, Brian J., 4,111,242, Cl. 140-124.000.

Miller, Conrad O. M.: *See—*
Gunsher, Jeffrey A.; Garner, Joseph L.; and Miller, Conrad O. M., 4,112,209, Cl. 526-65.000.

Miller, David Samuilovich: *See—*
Zuev, Alexandr Borisovich; and Miller, David Samuilovich, 4,110,894, Cl. 29-527.600.

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Miller, Stewart F.: *See—*
Bistrick, Eugene J.; Miller, Stewart F.; Abrahamsson, Axel B.; and Schlaf, Richard A., 4,111,586, Cl. 407-16.000.

Milliken Research Corporation: *See—*
O'Neill, John H., Jr., 4,111,012, Cl. 68-205.00R.

Milner, Ronald E.: *See—*
Mayer, Steven T.; and Milner, Ronald E., 4,112,422, Cl. 340-324.0AD.

Minakata, Matsuo: *See—*
Sando, Yoshikazu; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,111,434, Cl. 277-3.000.

Minami, Hidehiro, to Nissan Motor Company, Limited. Automotive internal combustion engine. 4,111,010, Cl. 60-276.000.

Minnesota Mining and Manufacturing Company: *See—*
Beck, Warren R., 4,111,713, Cl. 106-288.00B.
Fraik, Robert D., 4,111,702, Cl. 106-19.000.
Kruschel, William A., 4,111,022, Cl. 72-410.000.
Lange, Heinz E.; and Ostlie, Dean A., 4,111,462, Cl. 282-27.500.
Lange, Roger W.; and Sowman, Harold G., 4,112,186, Cl. 428-411.000.
Roiko, Russell A., 4,110,896, Cl. 29-566.300.
Salditt, Ferdinand; and Hansen, William L., 4,112,177, Cl. 428-304.000.
Strand, Neal T.; and Esboldt, Richard J., 4,110,925, Cl. 40-466.000.

Minolta Camera Kabushiki Kaisha: *See—*
Maeda, Keisuke; and Yamada, Seiji, 4,112,442, Cl. 354-31.000.

Mir, Jose Manuel; and Varner, Jerry Reubon, to Eastman Kodak Company. Electrographic mist development apparatus and method. 4,112,437, Cl. 346-159.000.

Mitkova, Galina Vladimirovna: *See—*
Vishnevsky, Alexandr Alexandrovich; Korolkov, Ivan Alexandrovich; Smirnov, Boris Andreevich; Ivanova, Tatyana Lukyanovna; Adamian, Arnold Aramovich; and Mitkova, Galina Vladimirovna, 4,111,206, Cl. 128-305.000.

Mitsubishi Chemical Industries Limited: *See—*
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,111,932, Cl. 260-239.100.
Okano, Takeshi; Wada, Naoto; and Kobayashi, Yoshimitsu, 4,112,241, Cl. 560-246.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Fukuda, Shozo; Seike, Yajuro; Iizuka, Masafumi; Kasai, Hironao; and Enami, Mamoru, 4,111,811, Cl. 210-242.00S.

Mitsubishi Kasei Kogyo Kabushiki Kaisha: *See—*
Yamawaki, Takeshi; Hoshijima, Tokitaro; and Aga, Kiichiro, 4,111,039, Cl. 73-81.000.

Mitsubishi Petrochemical Company Limited: *See—*
Aritomi, Mitsutoshi, 4,111,871, Cl. 260-22.0CB.

Mitsubishi Precision Co., Ltd.: *See—*
Kumazawa, Toshiharu, 4,112,026, Cl. 261-29.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Ishii, Hiromichi; Matsuzawa, Hideo; Kobayashi, Masao; and Yamada, Kantaro, 4,111,984, Cl. 562-538.000.
Kamada, Kazumasa; and Hongo, Masafumi, 4,111,892, Cl. 260-40.00R.

Okada, Kazuya; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,111,985, Cl. 562-546.000.
Sato, Mitsuo; Miyagawa, Norio; and Kobayashi, Juichi, 4,112,190, Cl. 428-457.000.
Mitsui Coke Co., Ltd.: *See*—
Sugimura, Hidehiko; Murakami, Hisashi; Ohtsubo, Toshikatsu; and Fukuda, Kenji, 4,111,786, Cl. 208-8.000.
Mitsui Mfg. Co., Ltd.: *See*—
Mitsui, Yoshiaki, 4,110,895, Cl. 29-564.200.
Mitsui, Yoshiaki, to Mitsui Mfg. Co., Ltd. Apparatus for manufacturing laminated cores. 4,110,895, Cl. 29-564.200.
Mixan, Craig E.: *See*—
Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,111,988, Cl. 260-543.00R.
Miyagawa, Norio: *See*—
Sato, Mitsuo; Miyagawa, Norio; and Kobayashi, Juichi, 4,112,190, Cl. 428-457.000.
Miyagi, Hideo; Oishi, Kiyohiko; Ishida, Yasuhiko; and Yamaguchi, Shunzo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippon Soken, Inc. Apparatus for introducing secondary air into an exhaust system of an internal combustion engine. 4,110,979, Cl. 60-276.000.
Miyagi, Hiroyuki; Nakajima, Fumito; and Arikawa, Yoshijiro, to Hitachi, Ltd. Interface for use in a combined liquid chromatography - mass spectrometry system. 4,112,297, Cl. 250-288.000.
Miyai, Akira: *See*—
Nakajima, Yukihiko; Watanabe, Shuzou; Miyai, Akira; and Ishii, Masaji, 4,112,290, Cl. 219-275.000.
Miyake, Tetsuya; Seko, Maomi; Inada, Kohji; Ochi, Kazushi; and Sakamoto, Tomio, to Asahi Kasei Kogyo Kabushiki Kaisha. Chromatographic separation of uranium isotopes. 4,112,044, Cl. 423-7.000.
Miyaki, Tetsuya: *See*—
Seko, Maomi; and Miyaki, Tetsuya, 4,112,045, Cl. 423-7.000.
Miyamoto, Hiroshi; and Shinagawa, Mitsuhisa, to Hitachi, Ltd. Self-excited mixer circuit using field effect transistor. 4,112,373, Cl. 325-440.000.
Mizuno, Yoshifumi: *See*—
Mori, Kogoro; Izawa, Taro; Mizuno, Yoshifumi; and Matsui, Sadayoshi, 4,111,879, Cl. 260-29.60N.
Mobil Oil Corporation: *See*—
Caesar, Philip D.; Garwood, William E.; Krudewig, William F.; and Wise, John J., 4,111,792, Cl. 208-79.000.
Chen, Nai Yuen; Miale, Joseph Nicolas; and Reagan, William Joseph, 4,112,056, Cl. 423-329.000.
Haag, Werner O.; and Whitehurst, Darrell Duayne, 4,111,856, Cl. 521-30.000.
Mockel, Gerrit: *See*—
Heger, Adolf; Mockel, Gerrit; Passler, Helmar; Pohlink, Jochen; and Wunsch, Werner, 4,112,136, Cl. 427-36.000.
Mockett, John Edward: *See*—
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Model, Frank S.: *See*—
Thomas, Norman W.; Model, Frank S.; and Smart, Charles L., 4,111,684, Cl. 71-115.000.
Moderatho, Bo, to Bo Moderatho & Company AB. Mount for X-ray films. 4,110,924, Cl. 40-158.00B.
Moerman, Nathan A. Conversion and control of electrical energy by electromagnetic induction. 4,112,347, Cl. 323-6.000.
Moffitt, Jerry T.; and Bulgrin, Robert W., to Allen-Bradley Company. Terminal for electrical component and method of making same. 4,112,250, Cl. 338-322.000.
Moffitt, Robert B., III: *See*—
Beard, Charles D.; and Moffitt, Robert B., III, 4,111,999, Cl. 260-606.50B.
Mohr, Adolph, to Robert Bosch GmbH. Anisotropic magnet structure, particularly segmental magnet structure for permanent magnet dynamo electric machines. 4,112,320, Cl. 310-154.000.
Molins, Desmond Walter; and Rowlands, Tom, to Molins Limited. Apparatus for joining axially abutting rods of the cigarette industry. 4,111,740, Cl. 156-498.000.
Molins Limited: *See*—
Molins, Desmond Walter; and Rowlands, Tom, 4,111,740, Cl. 156-498.000.
Moller, Eike; Meng, Karl, deceased (by Meng, Ilse Heide Frieda, legal representative); Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, to Bayer Aktiengesellschaft. 4-Substituted pyrazoles. 4,112,109, Cl. 424-273.00P.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, to Bayer Aktiengesellschaft. Pyrazol-5-ones. 4,112,227, Cl. 424-273.00P.
Momonoi, Kaishu: *See*—
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,112,090, Cl. 424-251.000.
Monarch Marking Systems, Inc.: *See*—
Cooke, Theodore M., 4,112,151, Cl. 427-322.000.
Hamisch, Paul H., Jr., 4,111,735, Cl. 156-384.000.
Hamisch, Paul H., Jr., 4,111,736, Cl. 156-384.000.
Klein, Rudolph J., 4,112,344, Cl. 318-685.000.
Monitoring Systems Inc.: *See*—
Bailey, John M., 4,111,047, Cl. 73-302.000.
Monroe, Kenneth E.: *See*—
Waldorf, Lindsey E.; and Monroe, Kenneth E., 4,112,393, Cl. 331-109.000.
Monsanto Company: *See*—
Bachman, Gerald L., 4,111,925, Cl. 260-112.50R.
Bradley, Bruce R.; Eckelman, Larry D.; and Gilmer, Donald G., 4,110,965, Cl. 57-157.0TS.
Bruner, Albert H., 4,110,964, Cl. 57-157.0TS.
Chyu, Hyun S., 4,112,166, Cl. 428-141.000.
Dahms, Ronald H., 4,112,188, Cl. 428-436.000.
Eubanks, Lloyd S.; and Price, Jerry L., 4,111,982, Cl. 562-519.000.
Mount, Ramon A.; and Raffelson, Harold, 4,111,963, Cl. 260-346.750.
Wang, Donald S. T., 4,111,828, Cl. 252-182.000.
Monsen, Peter, to Signatron, Inc. Digital communications receiver for dual input signal. 4,112,370, Cl. 325-40.000.
Montagna, Angelo A.: *See*—
Yanik, Stephen J.; Montagna, Angelo A.; and Frayer, James A., 4,111,796, Cl. 208-216.000.
Montanelli, Michele: *See*—
Cambiuzzi, Giulio; and Montanelli, Michele, 4,110,949, Cl. 52-437.000.
Montaruli, Elio. Refillable cutting dispenser. 4,111,089, Cl. 83-542.000.
Montedison S.p.A.: *See*—
Foschini, Giorgio; Fiscelli, Nicolino; and Galli, Paolo, 4,111,835, Cl. 252-429.00C.
Montegari, Frank Alfred: *See*—
Gani, Venkappa Laxmappa; and Montegari, Frank Alfred, 4,112,314, Cl. 307-215.000.
Montiel, Esteban. Storage file and retrieval system. 4,111,504, Cl. 312-183.000.
Moon, Malcolm W.; and Kornis, Gabriel, to Upjohn Company, The. Furyl pyrazole thioamides. 4,111,939, Cl. 260-293.600.
Moon, Malcolm W.; and Kornis, Gabriel, to Upjohn Company, The. Thienyl pyrazole thioamides. 4,111,941, Cl. 260-293.600.
Moorby, Donald G.: *See*—
Lonseth, Palmer; Panter, Hubert Gerald; and Moorby, Donald G., 4,110,900, Cl. 29-596.000.
Lonseth, Palmer; Panter, Hubert Gerald; and Moorby, Donald G., 4,112,041, Cl. 264-263.000.
Moore, Sanford A. B.: *See*—
Greenham, Joseph G.; and Moore, Sanford A. B., 4,110,871, Cl. 17-33.000.
Moore & White Company, The: *See*—
Manfredi, John L., 4,111,745, Cl. 162-271.000.
Moracchioli, Robert: *See*—
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,111,260, Cl. 165-104.00S.
Moran, Daniel Bryan: *See*—
Allen, George Rodger, Jr.; Hanifin, John William, Jr.; Moran, Daniel Bryan; and Albright, Jay Donald, 4,112,095, Cl. 424-250.000.
Moreau, Marc, to Trefimetaux. Method for continuous extrusion. 4,111,023, Cl. 72-60.000.
Morel, Henri, to ITW de France, S.A. Ball and socket joint cage. 4,111,570, Cl. 403-18.000.
Morelle, Jean V.; and Lauzanne-Morelle, Eliane M. T. Metallic compositions. 4,112,085, Cl. 424-245.000.
Morelli, Morello: *See*—
Sanfilippo, Domenico; and Morelli, Morello, 4,112,007, Cl. 260-666.00A.
Morgan, Charles R., to W. R. Grace & Co. Hydantoin-containing polyene compositions. 4,112,233, Cl. 548-312.000.
Morgan Industries: *See*—
Buchberger, Gregory D., 4,112,384, Cl. 330-141.000.
Mori, Kazushige: *See*—
Matsuyoshi, Hideaki; Mori, Kazushige; and Shimono, Yukio, 4,111,319, Cl. 214-131.00A.
Mori, Kogoro; Izawa, Taro; Mizuno, Yoshifumi; and Matsui, Sadayoshi, to Ihara Chemical Industry Co., Ltd. Composition for inhibiting adhesion of shellfish and algae. 4,111,879, Cl. 260-29.60N.
Mori, Takaaki: *See*—
Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, 4,111,724, Cl. 148-175.000.
Morino, Yukio: *See*—
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Morishima, Susumu: *See*—
Ito, Yukio; and Morishima, Susumu, 4,111,116, Cl. 100-281.000.
Morissette, Gilles. Collapsible boat anchor. 4,111,147, Cl. 114-298.000.
Morita, Akira: *See*—
Ueno, Zene; Morita, Akira; Iwaki, Shigeo; Nagaoka, Tadahiko; and Inagaki, Tokuich, 4,111,161, Cl. 123-3.000.
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, to Mitsubishi Chemical Industries Limited. Amino acid derivatives of 6-(2-amino-2-arylacetamido)penicillanic acids. 4,111,932, Cl. 260-239.100.
Moritz, Werner, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Transmission line carrier. 4,111,236, Cl. 138-120.000.
Moriya, Makoto: *See*—
Masuda, Joji; and Moriya, Makoto, 4,111,275, Cl. 180-68.00R.
Morris, Jack LeRoy. Spent long gun shell caddy. 4,110,927, Cl. 42-1.00T.
Morris, James F., to United States of America, National Aeronautics and Space Administration. Thermocouples of molybdenum and iridium alloys for more stable vacuum-high temperature performance. 4,111,718, Cl. 136-236.00R.

Morrison, Bert L.: *See*—
Kempl, Willard E.; and Morrison, Bert L., 4,111,396, Cl. 251-328.000.

Morrison, Charles F. Injection system for fuel combustion. 4,111,641, Cl. 431-4.000.

Morrison, Robert A.; and Armstrong, Lyle C., to Lockheed Aircraft Corporation. Multicontact test probe apparatus. 4,112,363, Cl. 324-158.00P.

Morrow, Robert S.; and Penn, Lloyd D., to IRD Mechanalysis, Inc. Digital sweep circuit for generating sawtooth wave form. 4,112,382, Cl. 328-181.000.

Morse Boulger, Inc.: *See*—
Mainka, Christian M., 4,111,134, Cl. 110-328.000.

Mortensen, Alan Craig; and DeHart, Scott A., to Hewlett-Packard Company. Peak detector. 4,112,381, Cl. 328-150.000.

Morton-Norwich Products, Inc.: *See*—
Pelosi, Stanford S., Jr., 4,111,964, Cl. 260-347.700.

Moser, Louis. Percolator. 4,111,108, Cl. 99-289.00R.

Moshkevich, Evgeny Isaevich: *See*—
Lakomsky, Viktor Iosifovich; Sheiko, Ivan Vasilievich; Grigorenko, Georgy Mikhailovich; Torkhov, Gennady Fedorovich; Trigub, Vladimir Kirillovich; Korotkov, Albert Nikitovich; Kurganov, Viktor Mikhailovich; Moshkevich, Evgeny Isaevich; Pakhomov, Alexei Ivanovich; and Verkhovtsev, Emil Vasilievich, 4,112,246, Cl. 13-2.00P.

Motegi, Minoru: *See*—
Umeki, Shinji; Uebori, Tatsuo; and Motegi, Minoru, 4,112,184, Cl. 428-403.000.

Motorola, Inc.: *See*—
Schafft, Hugo Willy, 4,112,168, Cl. 428-198.000.
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Motoyama, Shimesu: *See*—
Funakoshi, Yoshiro; Asogawa, Tatsuo; Satake, Eiichi; Motoyama, Shimesu; Yamada, Shuri; and Kakukawa, Morio, 4,111,626, Cl. 425-203.000.

Motter, Theodore J.; Mattimoe, Paul T.; and Bartus, Stephen P., Jr., to Libbey-Owens-Ford Company. Automotive glazing structure and method of producing the same. 4,112,171, Cl. 428-213.000.

Mottini, Francis Joseph: *See*—
Duval, Jean-Claude; Mottini, Francis Joseph; Touron, Serge Auguste; Rennard, Jean-Jacques Francois; and Duval, Ruchela Marie, 4,112,505, Cl. 365-96.000.

Moulds, Gordon Mars, to Du Pont de Nemours, E. I., and Company. Polyamide fiber. 4,112,016, Cl. 260-849.000.

Mount, Ramon A.; and Raffelson, Harold, to Monsanto Company. Method for preparing maleic anhydride. 4,111,963, Cl. 260-346.750.

Mousteou, Roger: *See*—
Gratacos, Jaime; Perrolet, Christian; and Mousteou, Roger, 4,111,040, Cl. 73-105.000.

Moviefig APS: *See*—
Ravn, Borge Andreas, 4,110,926, Cl. 40-485.000.

Mraz, Joseph. Pneumatic conveying apparatus and method. 4,111,492, Cl. 302-39.000.

Muck, Karl-Friedrich: *See*—
Kostrzewa, Michael; and Muck, Karl-Friedrich, 4,111,858, Cl. 521-25.000.

Muckter, Heinrich: *See*—
van Wersch, Hubert Maria Agnes; Herrling, Siegfried; and Muckter, Heinrich, 4,112,077, Cl. 424-185.000.

Mueller, Wolfgang H.; Oswald, Alexis A.; and Hall, Daniel N., to Exxon Research & Engineering Co. Phosphoryl sulfenyl chloride olefin adducts. 4,112,024, Cl. 260-956.000.

Muhlfeld, Horst: *See*—
Schuhmacher, Gunter; and Muhlfeld, Horst, 4,111,913, Cl. 528-273.000.

Muhs, Donald Paul; and Hart, Russell Frank, to Bendix Corporation, The. Rate of change in altitude apparatus. 4,112,413, Cl. 340-27.00R.

Muijs, Herman M., to Shell Oil Company. Textile fiber lubricant. 4,111,819, Cl. 252-8.900.

Mullins, Rex, to Coal Industry (Patents) Limited. Underground mining machine with longwall guidance system. 4,111,487, Cl. 299-1.000.

Multinorm, B.V.: *See*—
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,110,959, Cl. 56-295.000.

Munroe, James L.: *See*—
Lavelle, Joseph E.; and Munroe, James L., 4,111,531, Cl. 350-293.000.

Murakami, Hisashi: *See*—
Sugimura, Hidehiko; Murakami, Hisashi; Ohtsubo, Toshikatsu; and Fukuda, Kenji, 4,111,786, Cl. 208-8.000.

Muramatsu, Takao: *See*—
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,111,539, Cl. 355-3.00R.

Murata, Bunjiro: *See*—
Ito, Katsuo; Murata, Bunjiro; Maeda, Yoji; and Hibino, Eiichi, 4,112,378, Cl. 325-464.000.

Murata Manufacturing Co., Ltd.: *See*—
Ito, Katsuo; Murata, Bunjiro; Maeda, Yoji; and Hibino, Eiichi, 4,112,378, Cl. 325-464.000.

Murayama, Naohiro; Fukuda, Makoto; Sakagami, Teruo; Suzuki, Shirou; Kokubu, Yoshikazu; and Enoki, Toshio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Apparatus and process for the electrolytic treatment of alkali metal halide solution with ion exchange membranes. 4,111,780, Cl. 204-266.000.

Murgor Electric Company, Inc.: *See*—
Murray, James T.; and Gorman, Walter T., 4,110,947, Cl. 52-249.000.

Murmann, Gunter: *See*—
Greiner, Gunter; and Murmann, Gunter, 4,112,278, Cl. 200-156.000.

Murphy, John A., Jr. Extruded metal solar collector roofing shingle. 4,111,188, Cl. 126-271.000.

Murphy, John R. Hydraulic motor with air distributor-operated valves. 4,110,981, Cl. 60-371.000.

Murray, James T.; and Gorman, Walter T., to Murgor Electric Company, Inc. Storage tank installation. 4,110,947, Cl. 52-249.000.

Murray Tovi Designs, Inc.: *See*—
Tovi, Murray, 4,112,486, Cl. 362-419.000.

Musashi Kabushiki Kaisha: *See*—
Ito, Yukio; and Morishima, Susumu, 4,111,116, Cl. 100-281.000.

Muschiatti, Lawrence Carl: *See*—
Briggs, Paul Clayton, Jr.; and Muschiatti, Lawrence Carl, 4,112,013, Cl. 260-878.00R.

Mutou, Toshiaki, to Tokico Ltd. Gas chamber forming method in closed cylinder of gas enclosed type. 4,110,888, Cl. 29-404.000.

Mutzner, John E.; and Ford, Gary P., to General Motors Corporation. Braid reinforced flexible brake hose. 4,111,237, Cl. 138-125.000.

Nadelson, Jeffrey, to Sandoz, Inc. Isoxazolyl benzamides. 4,112,108, Cl. 424-272.000.

Nagaoka, Shinji: *See*—
Yonemoto, Tomoo; Morino, Yukio; Ishida, Hiroaki; and Nagaoka, Shinji, 4,112,444, Cl. 354-106.000.

Nagaoka, Tadahiko: *See*—
Ueno, Zene; Morita, Akira; Iwaki, Shigeo; Nagaoka, Tadahiko; and Inagaki, Tokuich, 4,111,161, Cl. 123-3.000.

Nagasaki, Tadashi; Akatsu, Mitsuharu; and Ohtsu, Mitsuo, to Hitachi, Ltd. High voltage generator. 4,112,337, Cl. 315-411.000.

Nagasawa, Harumi: *See*—
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo; Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, 4,112,260, Cl. 179-18.0FC.

Nagasawa, Kouichi; Kosa, Yasunobu; and Meguro, Satoshi, to Hitachi, Ltd. Method for manufacturing complementary insulated gate field effect transistors. 4,110,899, Cl. 29-571.000.

Nagatoshi, Kikuo: *See*—
Inayoshi, Akio; Ito, Toshimichi; Nagatoshi, Kikuo; Nara, Toshihide; Sagata, Shinsuke; Tomari, Hitomi; Fujimoto, Noriki; and Kaji, Hidehiko, 4,111,898, Cl. 260-42.530.

Naito, Takayuki; Okumura, Jun; and Kamachi, Hajime, to Bristol-Myers Company. 7-(D-α-Hydroxy-2-arylacetamido)-3-(2-carboxyalkyl-2,3-dihydro-s-triazolo-[4,3-b]pyridazin-3-on-6-ylthiomethyl)-3-cephem-4-carboxylic acids and derivatives. 4,112,228, Cl. 544-26.000.

Najvar, Daniel J., to Dow Chemical Company, The. Radiation curable epoxy resin. 4,111,770, Cl. 204-159.150.

Nakada, Takashi; and Takoh, Toshiharu, to Tokyo Seimitsu Co. Ltd. Liquid crystal applied voltmeter. 4,112,361, Cl. 324-92.000.

Nakajima, Fumito: *See*—
Miyagi, Hiroyuki; Nakajima, Fumito; and Arikawa, Yoshijiro, 4,112,297, Cl. 250-288.000.

Nakajima, Koe; and Matumoto, Hiromi, to Nippon Steel Corporation. Straightening mill for section steel. 4,111,025, Cl. 72-164.000.

Nakajima, Masao; Masaki, Kenji; and Inoue, Mitsumasa, to Nissan Motor Company, Limited. Air-fuel ratio control system. 4,111,170, Cl. 123-119.0EC.

Nakajima, Yasuo: *See*—
Aoyama, Syuniti; Hayashi, Yoshimasa; and Nakajima, Yasuo, 4,111,165, Cl. 123-90.150.

Nakajima, Yukihiko; Watanabe, Shuzou; Miyai, Akira; and Ishii, Masaji, to Denki Kagaku Kogyo Kabushiki Kaisha. Evaporation vessel for use in vacuum evaporation. 4,112,290, Cl. 219-275.000.

Nakamura, Hiroo: *See*—
Sakazume, Akio; Iwata, Hiroshi; Nakamura, Hiroo; Ogawa, Hiroyuki; Kashiwazaki, Susumu; and Nakao, Saneaki, 4,111,000, Cl. 62-262.000.

Nakamura, Joji: *See*—
Shima, Takesaburo; Kozima, Hiroshi; Yoshida, Tomio; and Nakamura, Joji, 4,112,021, Cl. 260-880.00R.

Nakamura, Kenji; and Seno, Iwao, to L C Chemical Company Limited. Liquid crystal display device. 4,111,533, Cl. 350-337.000.

Nakamura, Norihiko; and Kawamura, Takahide, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for preventing afterburning in an internal combustion engine. 4,111,175, Cl. 123-198.0DC.

Nakamura, Yoshihiro: *See*—
Sato, Kuniaki; Nakamura, Yoshihiro; and Ninomiya, Hideaki, 4,111,578, Cl. 403-189.000.

Nakamura, Yoshimitsu; and Kojima, Hajime, to Matsushita Electric Works, Ltd. Method of fabricating rotor coil for coreless motors. 4,110,901, Cl. 29-598.000.

Nakamura, Yukio; and Kato, Shogo, to Seiko Koki Kabushiki Kaisha. Resettable self-timer. 4,112,448, Cl. 354-239.000.

Nakano, Eisyo: *See*—
Kaneko, Akira; Ishibashi, Ichiroh; and Nakano, Eisyo, 4,111,889, Cl. 260-31.80M.

Nakao, Hideo: *See*—
Yoshida, Eiichi; Nakao, Hideo; Goto, Norimasa; Sugiyama, Toul; and Kashiwaya, Sadao, 4,112,141, Cl. 427-142.000.

Nakao, Saneaki: *See*—
Sakazume, Akio; Iwata, Hiroshi; Nakamura, Hiroo; Ogawa, Hiroyuki; Kashiwazaki, Susumu; and Nakao, Saneaki, 4,111,000, Cl. 62-262.000.

Nakazawa, Kiwao; and Tanimoto, Akikazu, to Nippon Kogaku K.K. Apparatus for measuring the line width of a pattern. 4,112,309, Cl. 250-560.000.

Nalco Chemical Company: *See—*
Feistel, Gerald R.; and Pessimisis, George N., 4,111,843, Cl. 252-451.000.

Namba, Mutsusuke: *See—*
Torikai, Eiichi; Kawami, Youji; Kai, Shinichiro; Namba, Mutsusuke; and Simasaki, Shuhei, 4,111,866, Cl. 521-53.000.

Nara, Toshihide: *See—*
Inayoshi, Akio; Ito, Toshimichi; Nagatoshi, Kikuo; Nara, Toshihide; Sagata, Shinsuke; Tomari, Hitomi; Fujimoto, Noriki; and Kaji, Hidehiko, 4,111,898, Cl. 260-42.530.

Narasaki Shipbuilding Company Limited: *See—*
Ohsaka, Teruhiro, 4,111,145, Cl. 114-72.000.

Nasaki, Kunio: *See—*
Yamaguchi, Kazumasa; Nasaki, Kunio; and Ohshiro, Masanori, 4,112,324, Cl. 310-353.000.

Nash, James L.; Polich, Stanley J.; and Carrico, Philip H., to General Electric Company. Biaxial film process and rotary apparatus therefor. 4,112,034, Cl. 264-95.000.

National Appliance Company: *See—*
Folsom, Max H.; and Dickman, Michael D., 4,111,753, Cl. 195-126.000.

National Marine Service, Inc.: *See—*
Wright, David A.; and Walters, Chester H., 4,111,806, Cl. 210-115.000.

National Micronetics, Inc.: *See—*
Selig, Thomas R.; Yasar, Tugrul; and Coulton, Derek A., 4,112,196, Cl. 428-594.000.

National Research Development Corporation: *See—*
Dobson, John Vincent; and Dickinson, Thomas, 4,111,777, Cl. 204-195.00M.
Firth, Jack Graham; Gentry, Stephen John; and Jones, Alan, 4,111,658, Cl. 23-232.00E.

National Starch and Chemical Corp.: *See—*
Jarowenko, Wadym, 4,112,222, Cl. 536-111.000.

Naumann, Alfred W.: *See—*
Kurtz, Abraham N.; Cunningham, Robert W.; and Naumann, Alfred W., 4,111,983, Cl. 562-535.000.

Neff, Robert O.; Grunwald, Lynn O.; Potter, Roderick B.; and Hahn, Norbert, to Rite-Hite Corporation. Leveler assembly for a loading dock. 4,110,860, Cl. 14-71.700.

Nelson, Hugh A.; Schweinebraten, Raymond H.; Salemi, Nicholas A.; and Rexroad, James O., to Westinghouse Electric Corp. Drawout switchgear with levering-in mechanism. 4,112,269, Cl. 200-50.0AA.

Nelson, Max A.: *See—*
Fosnough, Robert D.; and Nelson, Max A., 4,112,376, Cl. 325-455.000.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-ω-phenoxy-PGD analogs. 4,111,995, Cl. 260-590.00C.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-ω-phenoxy-PGA or 9-deoxy-9,10-didehydro-PGD analogs. 4,111,996, Cl. 260-590.00D.

Nelson, Peter H.; and Untch, Karl G., to Syntex (U.S.A.) Inc. Esters of 2-substituted-5-oxo-5H-dibenzo[a,d]cycloheptenes having pharmaceutical activity, and methods and compositions for the use thereof. 4,112,114, Cl. 424-285.000.

Nelson, Richard L., to Walnut Sand & Gravel Co. Transportable silo. 4,111,314, Cl. 214-17.00A.

Nelson, Richard L., to Exxon Research & Engineering Co. Facsimile receiver. 4,112,468, Cl. 358-280.000.

Nemeth, Suzette B., to Avery International Corporation. Refastenable diaper tab closure. 4,111,205, Cl. 128-284.000.

Nerini, Fulvio. Drill attachment for converting rotary motion to reciprocatory motion. 4,111,060, Cl. 74-56.000.

Nesseldreher, Wilfried: *See—*
Becker, Willi; and Nesseldreher, Wilfried, 4,111,595, Cl. 415-90.000.

Nesvadba, Hans; and Reinshagen, Hellmuth, to Sandoz Ltd. Polyhalo alkyl or alkenyl alcohol esters of piperazino acids. 4,112,091, Cl. 424-250.000.

Netstal-Maschinen AG: *See—*
Hotz, Alfons, 4,112,516, Cl. 366-80.000.

Nettleton, Donald E., Jr.: *See—*
Bradner, William T.; Bush, James A.; and Nettleton, Donald E., Jr., 4,112,071, Cl. 424-118.000.

Neuber, Ralph E.; and Rehkopf, Charles H., to GTE Sylvania Incorporated. Apparatus for high voltage conditioning cathode ray tubes. 4,111,507, Cl. 316-27.000.

Neufeld, Alonzo J. Orthopedic upper and lower leg support. 4,111,195, Cl. 128-83.000.

New England Industrial Chemical Co.: *See—*
Feingold, Michael; and Sparks, John, 4,112,054, Cl. 423-245.000.

Newbould, Gilbert J.: *See—*
Burkart, Robert C.; and Newbould, Gilbert J., 4,111,590, Cl. 408-14.000.

Newland, Gordon C.; and Pacifici, James G., to Eastman Kodak Company. Plastic moldings and sheeting. 4,112,182, Cl. 428-336.000.

NFE International, Ltd.: *See—*
DeMarco, Thomas M., 4,111,670, Cl. 55-315.000.

Nichols, Kenneth Herbert: *See—*
Engler, Edward Martin; Nichols, Kenneth Herbert; Patel, Vishnubhai Vitthalbhai; Rivera, Nilda Martinez; and Schumaker, Robert Rhees, 4,111,857, Cl. 528-226.000.

Nicholson, Edward W.: *See—*
Cahn, Robert P.; and Nicholson, Edward W., 4,110,987, Cl. 60-652.000.

Nickstadt, Gerhard A.: *See—*
Blair, Ronald A.; Nickstadt, Gerhard A.; and Imbrogno, Gaetano O., 4,111,069, Cl. 74-606.00R.

Nicolaides, Ernest D.: *See—*
Wittle, Eugene Leroy; Rebstock, Mildred Catherine; Nicolaides, Ernest D.; and Campbell, Alfred, 4,111,923, Cl. 260-112.50R.

Nidola, Antonio: *See—*
De Nora, Vittorio; Nidola, Antonio; and Spaziante, Placido Maria, 4,111,765, Cl. 204-67.000.

Nieder-Vahrenholz, Hans-George: *See—*
Niederprum, Hans; Meussdoerffer, Johann-Nikolaus; Nieder-Vahrenholz, Hans-George; and Bockelmann, Wolfgang, 4,112,046, Cl. 423-53.000.

Niedermier, James B.: *See—*
Mechling, Charles H.; Niedermier, James B.; and Steber, Norman J., 4,111,676, Cl. 65-114.000.

Niederprum, Hans; Meussdoerffer, Johann-Nikolaus; Nieder-Vahrenholz, Hans-George; and Bockelmann, Wolfgang, to Bayer Aktiengesellschaft. Disintegration of silica-rich chromite. 4,112,046, Cl. 423-53.000.

Nielsen, Ramon W.; and Widmar, Craig C., to Carnation Company. Process for counter-coloring of decharacterized meat products. 4,112,126, Cl. 426-250.000.

Nigg, Jurg. Lamp holder for twin-socket type halogen lamps. 4,111,515, Cl. 339-112.00R.

Nihon Nohyaku Co., Ltd.: *See—*
Taninaka, Kuniaki; Kurono, Hitoshi; and Kasai, Tsutomu, 4,112,089, Cl. 424-248.550.

Nihon Seikan Kabushiki Kaisha: *See—*
Kawamata, Kiyoshi, 4,111,142, Cl. 113-1.00E.

Nihon Space Union Co., Ltd.: *See—*
Kiyosawa, Kesaomi, 4,111,577, Cl. 403-172.000.

Nill, Reiner: *See—*
Fath, Horst; and Nill, Reiner, 4,112,341, Cl. 318-370.000.

Nimmer, Terry L.: *See—*
Guif, Stanley E.; Nimmer, Terry L.; Weigt, Donald A.; Wolenec, Glenn; and Gall, Richard C., 4,112,464, Cl. 358-122.000.

Ninomiya, Hideaki: *See—*
Sato, Kuniaki; Nakamura, Yoshihiro; and Ninomiya, Hideaki, 4,111,578, Cl. 403-189.000.

Nippon Gaishi Kabushiki Kaishi: *See—*
Higuchi, Noboru; Ogasawara, Takayuki; and Seike, Shoji, 4,112,193, Cl. 428-539.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Adachi, Takeshi, 4,111,092, Cl. 84-1.270.
Hinago, Yasuhiro, 4,111,091, Cl. 84-1.010.
Ogita, Minoru, 4,112,371, Cl. 325-319.000.

Nippon Kogaku K.K.: *See—*
Akasaka, Shigeo, 4,112,449, Cl. 354-173.000.
Nakazawa, Kiwao; and Tanimoto, Akikazu, 4,112,309, Cl. 250-560.000.

Nippon Oil Seal Industry Company, Ltd.: *See—*
Yazawa, Hiroyuki, 4,111,436, Cl. 277-92.000.

Nippon Shinyaku Co., Ltd.: *See—*
Inoue, Sho; Sano, Akira; and Kitaguchi, Koji, 4,112,218, Cl. 536-5.000.

Nippon Soken, Inc.: *See—*
Miyagi, Hideo; Oishi, Kiyohiko; Ishida, Yasuhiko; and Yamaguchi, Shunzo, 4,110,979, Cl. 60-276.000.

Nippon Steel Corporation: *See—*
Nakajima, Koe; and Matumoto, Hiromi, 4,111,025, Cl. 72-164.000.

Nippon Zeon Co., Ltd.: *See—*
Komuro, Keiji; Ohishi, Tetsu; Waku, Tetsuo; Sugi, Nagatoshi; Suzuki, Souichi; and Ueda, Akio, 4,111,867, Cl. 260-5.000.

Nippondenso Co., Ltd.: *See—*
Norimatsu, Hideaki; Kobayashi, Akio; Masuda, Akira; and Kitajima, Sigenori, 4,111,162, Cl. 123-32.0EE.

Nisenbaum, Yakov Arkadievich: *See—*
Buzhinsky, Vladimir Lukyanovich; Raschepkin, Konstantin Egorovich; Dunjushkin, Mikhail Grigorievich; Lysogorsky, Gennady Tikhonovich; Valeev, Rustem Ibragimovich; Nisenbaum, Yakov Arkadievich; and Ikhsanov, Deviz Faizrakhmanovich, 4,110,862, Cl. 15-88.000.

Nishikawa, Masaji; Suzuki, Yoshiro; and Yasuda, Tadahiro, to Olympus Optical Co., Ltd. Devices for developing an electrostatic charge image on a record sheet by a developer solution. 4,111,156, Cl. 118-662.000.

Nishimiya, Torazo; Oyama, Yoshishige; and Oshima, Ryoichiro, to Hitachi, Ltd. Apparatus for purifying exhaust gas. 4,110,978, Cl. 60-276.000.

Nishimura, Osamu: *See—*
Fujino, Masahiko; Nishimura, Osamu; and Kitada, Chieko, 4,111,924, Cl. 260-112.50R.

Nishizawa, Mamoru; and Hisatomi, Takashi, to Nissan Motor Company, Limited. System to feed exhaust gas into the induction passage of an internal combustion engine. 4,111,172, Cl. 123-119.00A.

Nissan Motor Company, Limited: *See—*
Aono, Shigeo; and Asano, Masaharu, 4,111,171, Cl. 123-119.0EC.
Aoyama, Syuniti; Hayashi, Yoshimasa; and Nakajima, Yasuo, 4,111,165, Cl. 123-90.150.
Kawasaki, Teruo, 4,112,338, Cl. 318-59.000.
Masuda, Joji; and Moriya, Makoto, 4,111,275, Cl. 180-68.00R.
Minami, Hidehiro, 4,111,010, Cl. 60-276.000.

Nakajima, Masao; Masaki, Kenji; and Inoue, Mitsumasa, 4,111,170, Cl. 123-119.0EC.
Nishizawa, Mamoru; and Hisatomi, Takashi, 4,111,172, Cl. 123-119.00A.
Torii, Shinkity; Kawagoshi, Sakae; Yoneshige, Tetsuhiko; and Ito, Hidehumi, 4,111,848, Cl. 252-466.0PT.
Ueno, Zene; Morita, Akira; Iwaki, Shigeo; Nagaoka, Tadahiko; and Inagaki, Tokuich, 4,111,161, Cl. 123-3.000.
Yoshida, Eiichi; Nakao, Hideo; Goto, Norimasa; Sugiyama, Toul; and Kashiwaya, Sadao, 4,112,141, Cl. 427-142.000.

Nitro Nobel AB: *See—*
Enoksson, Bertil Petrus, 4,111,400, Cl. 256-47.000.

Nitta, Takahisa: *See—*
Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, 4,111,724, Cl. 148-175.000.

Nix, Edwin Lee; and Davenport, Bobby E. Truck bed liner. 4,111,481, Cl. 296-39.00R.

Nocon, Barbara: *See—*
Swietoslawski, Janusz; Silowiecki, Andrzej; Ratajczak, Aleksander; Nocon, Barbara; and Baniak, Zofia, 4,112,242, Cl. 568-726.000.

Noetzel, Siegfried; Jastrow, Horst; and Uebe, Rudolf, to Hoechst Aktiengesellschaft. Bromine-containing phosphinic acid esters and flame-resistant plastic molding compositions. 4,111,900, Cl. 260-45.70P.

Noguchi, Shunsaku; Aono, Tetsuya; Araki, Yoshiaki; and Kawai, Kiyohisa, to Takeda Chemical Company, Ltd. Benzalicyclic carboxylic acid derivative. 4,111,997, Cl. 260-591.000.

Noguchi, Toyota: *See—*
Mifune, Hideo; Tani, Kenroku; and Noguchi, Toyota, 4,112,420, Cl. 340-550.000.

Noone, Michael J.; and Gatti, Arno, to General Electric Company. Ceramic-metal assembly. 4,111,572, Cl. 403-28.000.

Norgaard, Erik Bach, to Borden Ost A/S. Slice dispenser unit. 4,111,333, Cl. 221-73.000.

Norimatsu, Hideaki; Kobayashi, Akio; Masuda, Akira; and Kitajima, Sigenori, to Nippondenso Co., Ltd. Method and system for controlling the mixture air-to-fuel ratio. 4,111,162, Cl. 123-32.0EE.

Normark Corporation: *See—*
Ruder, Nils, 4,110,914, Cl. 33-355.00D.

North Oakland Development Corporation: *See—*
Blachura, Leon, 4,110,952, Cl. 52-745.000.

North Western Scaffolding Company Limited: *See—*
Knight, Stephen Vincent, 4,111,579, Cl. 403-387.000.

Northern Conveyor & Manufacturing Corp.: *See—*
Zimmerman, John E.; and Reis, Richard M., Sr., 4,11[illegible], Cl. 69-21.000.

Northup, Robert Powers, to United States of America, Army. Hydraulic control for hydromechanical transmission. 4,111,074, Cl. 74-867.000.

Norton Company: *See—*
Adams, David G., 4,111,667, Cl. 51-295.000.
Devine, Donald R.; and Gardiner, William L., 4,111,280, Cl. 182-8.000.

Novak, John. Electric plug lock means. 4,1[illegible],509, Cl. 339-14.00P.

Novello, Frederick C.; and Baldwin, John J., to Merck & Co., Inc. Anti-hyperuricemia composition. 4,111,944, Cl. 260-296.00R.

Nowak, Edward Norbert; Wideman, Lawson Gibson; and Hutchings, David Alan, to Goodyear Tire & Rubber Company, The. Production of hydroquinone from nonaqueous solvent systems. 4,112,243, Cl. 568-768.000.

Nowak, Edward Norbert; and Hollingshead, William Shepherd, to Goodyear Tire & Rubber Company, The. Recovery of hydroquinone. 4,112,244, Cl. 568-768.000.

Nozawa, Nobuhiro: *See—*
Komorita, Fujio; Nozawa, Nobuhiro; and Inoue, Satoshi, 4,111,707, Cl. 106-47.00Q.

Numata, Saburo; and Okazaki, Shinichiro, to Fuji Photo Optical Co., Ltd. Exposure control circuit for cameras with shutter release locking means. 4,112,446, Cl. 354-50.000.

Nunan, Craig S., to Varian Associates, Inc. Neutron irradiation therapy machine. 4,112,306, Cl. 250-499.000.

Nussbaumer, Thomas, to Patent & Inventions Ltd. Closure device for an injection molding machine or injection press. 4,111,629, Cl. 425-451.200.

Nusslein, Ludwig; and Pieroh, Ernst Albrecht, to Schering Aktiengesellschaft. 5-Nitrothiazole containing pesticide composition. 4,112,107, Cl. 424-270.000.

Nutter, Geoffrey; and McGibbon, William, to Ferranti Limited. Apparatus for writing data in unique order into and retrieving same from memory. 4,112,487, Cl. 364-200.000.

N.V. Industrieele Handelscombinatie Holland: *See—*
de Fremery, Frank P., 4,111,467, Cl. 285-136.000.

N.V. Optische Industrie "de Oude Delft": *See—*
Versteeg, Frits Johan, 4,111,528, Cl. 350-175.00E.

Oak Industries Inc.: *See—*
Guif, Stanley E.; Nimmer, Terry L.; Weigt, Donald A.; Wolenec, Glenn; and Gali, Richard C., 4,112,464, Cl. 358-122.000.

Oates, Robert M.; and Heinrich, Theodore M., to White-Westinghouse Corporation. Central oscillator for induction range using triac burner controls. 4,112,287, Cl. 219-10.49R.

Oberberger, Otto: *See—*
Eggert, Hans Joachim; Oberberger, Otto; Zenkert, Heinrich; and Kuehne, Rudi, 4,111,328, Cl. 220-4.00R.

Oberlander, Claude: *See—*
Dumont, Claude; and Oberlander, Claude, 4,112,093, Cl. 424-250.000.

Obiya, Yasuaki; and Ikeda, Saburoo, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for closing guide vanes of a hydraulic machine. 4,111,101, Cl. 91-405.000.

O'Brien, John: *See—*
Krueger, Theodore H., Jr.; Eller, Robert; O'Brien, John; and Robbins, William L., 4,111,255, Cl. 164-255.000.

Obrist, Albert; and Aichinger, Dietmar, to Albert Obrist AG. Synthetic plastic cap for bottles. 4,111,322, Cl. 215-230.000.

Ochi, Kazushi: *See—*
Miyake, Tetsuya; Seko, Maomi; Inada, Kohji; Ochi, Kazushi; and Sakamoto, Tomio, 4,112,044, Cl. 423-7.000.

O'Donnell, Brian: *See—*
Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, 4,110,889, Cl. 29-407.000.

Ogasawara, Takayuki: *See—*
Higuchi, Noboru; Ogasawara, Takayuki; and Seike, Shoji, 4,112,193, Cl. 428-539.000.

Ogawa, Hiroyuki: *See—*
Sakazume, Akio; Iwata, Hiroshi; Nakamura, Hiroo; Ogawa, Hiroyuki; Kashiwazaki, Susumu; and Nakao, Saneaki, 4,111,000, Cl. 62-262.000.

Ogawa, Mutsuo, to Ricoh Co., Ltd. Failure mode control apparatus for electronic graphic data transmission system. 4,112,467, Cl. 358-257.000.

Ogawa, Shinsaku: *See—*
Seko, Maomi; Ogawa, Shinsaku; Ajiki, Nobuo; and Yoshida, Muneo, 4,111,779, Cl. 204-255.000.

Ogawa, Sigeru: *See—*
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo; Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, 4,112,260, Cl. 179-18.0FC.

Ogen, Thomas: *See—*
Abramson, Carl N.; Kohl, David; and Ogen, Thomas, 4,112,264, Cl. 179-175.30R.

Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha. Muting and tuning indicator system for an FM receiver. 4,112,371, Cl. 325-319.000.

Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, to Hitachi, Ltd. Method of manufacturing oxide isolated semiconductor device utilizing selective etching technique. 4,111,724, Cl. 148-175.000.

Oglia, Thomas F.: *See—*
Anderson, Paul L.; and Oglia, Thomas F., 4,112,117, Cl. 424-304.000.

Ohannesian, Michael J.: *See—*
Wendler, Gunter K.; Corpus, Enrique; and Ohannesian, Michael J., 4,110,886, Cl. 29-255.000.

Ohhinata, Ichiro, to Hitachi, Ltd. Semiconductor switch circuit. 4,112,315, Cl. 307-254.000.

Ohhinata, Ichiro: *See—*
Tokunaga, Michio; Ohhinata, Ichiro; and Okuhara, Shinzi, 4,112,346, Cl. 323-4.000.

Ohishi, Tetsu: *See—*
Komuro, Keiji; Ohishi, Tetsu; Waku, Tetsuo; Sugi, Nagatoshi; Suzuki, Souichi; and Ueda, Akio, 4,111,867, Cl. 260-5.000.

Ohishi, Yoshikatsu, to Rank Xerox, Ltd. Platen cover for prevention of displacement of an original. 4,111,550, Cl. 355-75.000.

Ohsaka, Teruhiro, to Narasaki Shipbuilding Company Limited. Roll on/off - lift on/off cargo vessel. 4,111,145, Cl. 114-72.000.

Ohshiro, Masanori: *See—*
Yamaguchi, Kazumasa; Nasaki, Kunio; and Ohshiro, Masanori, 4,112,324, Cl. 310-353.000.

Ohsugi, Motoyoshi: *See—*
Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,111,990, Cl. 260-561.00R.

Ohtsu, Mitsuo: *See—*
Nagasaki, Tadashi; Akatsu, Mitsuharu; and Ohtsu, Mitsuo, 4,112,337, Cl. 315-411.000.

Ohtsubo, Toshikatsu: *See—*
Sugimura, Hidehiko; Murakami, Hisashi; Ohtsubo, Toshikatsu; and Fukuda, Kenji, 4,111,786, Cl. 208-8.000.

Ohya, Junichi: *See—*
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,111,932, Cl. 260-239.100.

Oishi, Kiyohiko: *See—*
Miyagi, Hideo; Oishi, Kiyohiko; Ishida, Yasuhiko; and Yamaguchi, Shunzo, 4,110,979, Cl. 60-276.000.

Oka, Katsumi: *See—*
Okada, Motohiro; Oka, Katsumi; Honda, Kiyoshi; and Matsuura, Kazuo, 4,111,458, Cl. 280-739.000.

Okabe, Hiromichi: *See—*
Kotera, Norio; Okabe, Hiromichi; and Korenaga, Hiroshi, 4,111,979, Cl. 260-509.000.

Okada, Kazuya; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, to Mitsubishi Rayon Co., Ltd. Process for producing unsaturated aldehydes and unsaturated carboxylic acids. 4,111,985, Cl. 562-546.000.

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Baird, William G., Jr.; Holbrook, Stanley E.; and Platt, Jeremy A., deceased, 4,112,181, Cl. 428-336.000.

Plessey Handel und Investments AG.: *See*—
Quincey, Edwin Albert, 4,111,655, Cl. 422-124.000.

Plum, Hans; and Schroeer, Ulrich, to Schering Aktiengesellschaft. Bactericidal and fungicidal tin compounds. 4,112,084, Cl. 424-226.000.

Plummer, William T., to Polaroid Corporation. Defocused unicell photometer with diffusion zone. 4,111,561, Cl. 356-225.000.

Plumridge, Jane. Medical applicator assembly for chain cystourethrographic procedure. 4,111,190, Cl. 128-2.00A.

Plut, Louis. Appliance transport accessory. 4,111,132, Cl. 105-469.000.

Pocsi, Powell J.: *See*—
Thurston, Bruce E.; Owens, Albert H.; and Pocsi, Powell J., 4,111,513, Cl. 339-143.00R.

Pogge, H. Bernhard: *See*—
Mader, Siegfried R.; Masters, Burton J.; and Pogge, H. Bernhard, 4,111,719, Cl. 148-1.500.

Pohlink, Jochen: *See*—
Heger, Adolf; Mockel, Gerrit; Passler, Helmar; Pohlink, Jochen; and Wunsch, Werner, 4,112,136, Cl. 427-36.000.

Pohlman, William B.; and Volk, Andrew M., to Intel Corporation. Data transfer control apparatus and method. 4,112,490, Cl. 364-200.000.

Poignant, Jean-Claude: *See*—
Regnier, Gilbert; Canevari, Roger; and Poignant, Jean-Claude, 4,112,092, Cl. 424-250.000.

Poker, John M., Jr., to Caterpillar Tractor Co. Bucket cutting edge. 4,110,921, Cl. 37-141.00R.

Pol, Gerrit Vander: *See*—
Schroeder, Merrill W., 4,111,364, Cl. 239-77.000.

Polaroid Corporation: *See*—
Charkoudian, John C.; and Hoffman, Arnold, 4,112,205, Cl. 429-199.000.
Plummer, William T., 4,111,561, Cl. 356-225.000.

Polaski, David N.: *See*—
Bolinger, Jimmy W.; Pollman, Frederic W.; and Polaski, David N., 4,111,003, Cl. 60-469.000.

Polich, Stanley J.: *See*—
Nash, James L.; Polich, Stanley J.; and Carrico, Philip H., 4,112,034, Cl. 264-95.000.

Pollard, Christopher A.; and Stiven, David, to Burroughs Corporation. Disk cartridge contamination shield. 4,112,471, Cl. 360-98.000.

Pollet, Robert Joseph; Vandenberghe, Antoon Leon; Danckaert, Valere Frans; Willems, Jozef Frans; and Van Veelen, George Frans, to Agfa-Gevaert, N. V. Novel antifogging and/or stabilizing compounds for silver halide photography. 4,111,697, Cl. 96-66.500.

Pollman, Frederic W.: *See*—
Bolinger, Jimmy W.; Pollman, Frederic W.; and Polaski, David N., 4,111,003, Cl. 60-469.000.

Polony, Rudolf; Rauchle, Adolf; and Heizler, Fritz, to Ciba-Geigy Corporation. Synergistic microbicidal composition. 4,111,844, Cl. 252-106.000.

Polymer-Physik GmbH & Co. KG: *See*—
Foll, Eberhard; and Vetter, Helmut, 4,112,307, Cl. 250-510.000.

Polysar Limited: *See*—
Buckler, Ernest Jack; and Richmond, Michael Hugh, 4,111,349, Cl. 229-3.50R.

Pompei, Michel; and Casse, Christian Robert, to Paulstra. System for controlling the deformation of side elements of vehicle bumpers. 4,111,478, Cl. 293-63.000.

Ponni, Hannu: *See*—
Jolanki, Jorma; Saxelin, Ilpo; and Ponni, Hannu, 4,111,560, Cl. 356-205.000.

Popeil Brothers, Inc.: *See*—
Popeil, Samuel J., 4,112,127, Cl. 426-283.000.

Popeil, Samuel J., to Popeil Brothers, Inc. Method for processing and filling a dough product. 4,112,127, Cl. 426-283.000.

Popenhagen, Gerald R.: *See*—
Rao, Ganta V.; Shoup, Floyd K.; and Popenhagen, Gerald R., 4,112,133, Cl. 426-650.000.

Porteous, Kenneth; Falkenberg, Leigh; and Lane, Stephen, to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources; Her Majesty the Queen in right of the Province of Alberta, Department of, Education Energy and Natural Resources, Alberta Syncrude Equity; Ontario Energy Corporation; Imperial Oil Limited; Canada-Cities Service, Ltd.; and Gulf Oil Canada Limited. Recovery of hydrocarbon from dilution centrifuging tailings. 4,111,789, Cl. 208-11.0LE.

Poseidon Marketing and Development Co.: *See*—
Lundh, Roy Walfrid, 4,110,994, Cl. 405-158.000.

Posipanko, Thomas: *See*—
Buckwalter, Mervin R.; Bulson, Walter T.; Leininger, Larry W.; Posipanko, Thomas; and Ray, Leonard N., Jr., 4,111,646, Cl. 8-2.50A.

Postman, William; Louch, James B.; and Buchert, Hermann, to Dow Badische Company. Processability of melt spun yarns. 4,111,818, Cl. 252-8.900.

Potomac Applied Mechanics, Inc.: *See*—
Stubbings, James Henry, 4,111,143, Cl. 113-1.00N.

Pott, Ronald W.; and Grimm, William G. Laminable convertible molding for hand rails and the like. 4,112,195, Cl. 428-542.000.

Potter, Roderick B.: *See*—
Neff, Robert O.; Grunwald, Lynn O.; Potter, Roderick B.; and Hahn, Norbert, 4,110,860, Cl. 14-71.700.

Potts, Herbert Alexander: *See*—
Ward, Frank, deceased; Hildreth, John David; and Potts, Herbert Alexander, 4,111,649, Cl. 8-41.00R.

Powell, Virgil. Night light belt. 4,112,482, Cl. 362-108.000.

PPG Industries, Inc.: *See*—
Cathers, William P., 4,111,412, Cl. 271-251.000.
Donley, Harold E.; and Cathers, William P., 4,111,150, Cl. 118-7.000.
Mechling, Charles H.; Niedermier, James B.; and Steber, Norman J., 4,111,676, Cl. 65-114.000.

Pracher, Ernst; Schrotter, Wolfgang Adalbert; and Heider, Wolfgang, to Bunker Ramo Corporation. Miniature relay. 4,112,399, Cl. 335-106.000.

Pray, Winston C., to Flexible Steel Lacing Company. Staple fastening tool. 4,111,080, Cl. 29-243.510.

Preload Technology, Inc.: *See*—
Marchaj, Tadeusz J., 4,110,995, Cl. 62-50.000.

Presby, Herman Melvin: *See*—
Kaminow, Ivan Paul; and Presby, Herman Melvin, 4,111,525, Cl. 350-96.310.

President and Fellows of Harvard College: *See*—
Lange, Louis G., III; and Vallee, Bert L., 4,111,751, Cl. 195-66.00R.

Presley, J. M. Vertical pipe holding tool. 4,111,388, Cl. 248-49.000.

Pressiat, Robert, to Thomson-CSF. Radiant energy detection system for the angular location of a light-radiating object. 4,112,294, Cl. 250-203.00R.

Preus, Paul. Hydrocarbon containment and control systems. 4,111,813, Cl. 210-282.000.

Preuss, Ralph I.: *See*—
Pascale, Frank R.; and Preuss, Ralph I., 4,111,124, Cl. 101-426.000.

Prewo, Karl Michael, to United Technologies Corporation. Composite rotor blade. 4,111,606, Cl. 416-224.000.

Price, David Watkin; Hodges, Newton John; and Furley, Robert, to Coal Industry (Patents) Limited. Lute. 4,111,709, Cl. 106-67.000.

Price, Jerry L.: *See*—
Eubanks, Lloyd S.; and Price, Jerry L., 4,111,982, Cl. 562-519.000.

Process Scientific Innovations Limited: *See—*
Walker, Brian; Hunter, George Sherwood; and Hunter, Susanne Phyllis, 4,111,815, Cl. 210-487.000.

Procter & Gamble Company, The: *See—*
Barrat, Christian Roland; Arnau, Jose Luis; and Wevers, Jean, 4,111,855, Cl. 252-545.000.
Dake, Timothy William; Clunie, James Spence; and Early, Allen Dale, 4,112,167, Cl. 428-154.000.
Spadini, Gianfranco Luigi; and Demessemaekers, Emiel Mathilde Anna Alfons, 4,111,854, Cl. 252-541.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Carel, Philippe Robert Raymond; Decamp, Rene Paul Auguste; and Perronin, Jean, 4,112,155, Cl. 427-439.000.

Professional Packaging Limited: *See—*
Holmes, Gordon W., 4,110,953, Cl. 53-419.000.

Prox, Larry M.: *See—*
Krelis, Peter S.; and Prox, Larry M., 4,111,405, Cl. 266-158.000.

Pryor, Harold A.: *See—*
Pryor, Roy R.; and Pryor, Harold A., 4,111,573, Cl. 403-42.000.

Pryor, Michael J., to Swiss Aluminium Ltd. Process for improving corrosion resistant characteristics of chrome plated aluminum and aluminum alloys. 4,111,763, Cl. 204-38.00A.

Pryor, Roy R.; and Pryor, Harold A. Triple leg coupler. 4,111,573, Cl. 403-42.000.

Przybyla, Franciszek J.; and Smith, Michael J., to P. R. Mallory & Co., Inc. Metal-air depolarized cell with restricted water vapor access. 4,112,198, Cl. 429-27.000.

Puddington, Ira E.: *See—*
Meadus, Frederick W.; Sparks, Bryan D.; and Puddington, Ira E., 4,111,874, Cl. 260-23.00R.

Puffr, Rudolf; and Sebenda, Jan, to Ceskoslovenska akademie ved. Method for the polymerization of lactams. 4,111,869, Cl. 260-18.00N.

Pugin, Andre: *See—*
L'Eplattenier, Francois; Pugin, Andre; and von der Crone, Jost, 4,111,947, Cl. 260-299.000.

Pullman Incorporated: *See—*
Benko, John M., 4,111,404, Cl. 266-58.000.

Purcell, Robert J., to Caterpillar Tractor Co. Sprocket segments providing greater retention capabilities. 4,111,064, Cl. 74-243.0DR.

Pusch, Walter George, to Johns-Manville Corporation. High density asbestos-free tobermorite thermal insulation containing wollastonite. 4,111,712, Cl. 106-120.000.

Quincey, Edwin Albert, to Plessey Handel und Investments AG. Electrically operated air fresheners. 4,111,655, Cl. 422-124.000.

R. Alkan & Cie: *See—*
Bourrie, Georges; and Lensel, Robert, 4,111,473, Cl. 292-126.000.

Raabe, Herbert P. Tone arm control system. 4,111,433, Cl. 274-23.00R.

Rabinow, Jacob, to Hall & Myers. Pickproof lock. 4,111,019, Cl. 70-358.000.

Raffelson, Harold: *See—*
Mount, Ramon A.; and Raffelson, Harold, 4,111,963, Cl. 260-346.750.

Rainville Company, Inc.: *See—*
Rainville, Dewey, 4,111,635, Cl. 425-533.000.

Rainville, Dewey, to Rainville Company, Inc. Manifold in substantial alignment with plasticizer. 4,111,635, Cl. 425-533.000.

Rajczi, Frank D.: *See—*
McAllister, William D.; and Rajczi, Frank D., 4,110,883, Cl. 29-148.40S.

Rambold, Adolf. Infusion bag and method of packaging infusion bag. 4,110,955, Cl. 53-445.000.

Ramnarace, Jawaharlal. Gas generator propellants. 4,111,728, Cl. 149-19.500.

Ramsey, Alan: *See—*
Annis, Martin; Bjorkholm, Paul; Cobb, Carolus M.; Frederick, Edwin; and Ramsey, Alan, 4,112,301, Cl. 250-364.000.

Ranco Incorporated: *See—*
Semple, Alexander M., 4,111,358, Cl. 236-15.00A.

Randall, Robert Paul, to EMI Limited. X-ray tube arrangement. 4,112,397, Cl. 250-401.000.

Rank Xerox, Ltd.: *See—*
Ohishi, Yoshikatsu, 4,111,550, Cl. 355-75.000.

Rankin, Andrew Francis. Flexible wall pump. 4,111,616, Cl. 417-472.000.

Rao, Ashok D.: *See—*
Ban, Thomas E.; and Rao, Ashok D., 4,111,755, Cl. 201-6.000.

Rao, Ganta V.; Shoup, Floyd K.; and Popenhagen, Gerald R., to Far-Mar-Co, Inc. Liquid smoke composition and method of making same. 4,112,133, Cl. 426-650.000.

Rapatel, Bernard. Sanitary appliance. 4,110,851, Cl. 4-166.000.

Rapson, John Edward; and Alders, Dean, to Hovercraft Development Limited. Skirts for gas cushion vehicles. 4,111,276, Cl. 180-117.000.

Raschepkin, Konstantin Egorovich: *See—*
Buzhinsky, Vladimir Lukyanovich; Raschepkin, Konstantin Egorovich; Dunjushkin, Mikhail Grigorievich; Lysogorsky, Gennady Tikhonovich; Valeev, Rustem Ibragimovich; Nisenbaum, Yakov Arkadievich; and Ikhsanov, Deviz Faizrakhmanovich, 4,110,862, Cl. 15-88.000.

Ratajczak, Aleksander: *See—*
Świetoslawski, Janusz; Silowiecki, Andrzej; Ratajczak, Aleksander; Nocon, Barbara; and Baniak, Zofia, 4,112,242, Cl. 568-726.000.

Rath, Heinz-Jorg; Schmidt, Dietrich; and Zulehner, Werner, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for producing crucible-drawn silicon rods containing volatile doping agents. 4,111,742, Cl. 156-617.0SP.

Rath, Heinz-Jorg: *See—*
Lang, Winfried; Schmidt, Dietrich; Hofer, Johann; Pachnek, Rudolf; and Rath, Heinz-Jorg, 4,112,057, Cl. 423-342.000.

Rauch, Hubert: *See—*
Boessler, Hanns; and Rauch, Hubert, 4,112,215, Cl. 528-503.000.

Rauchenecker, Konrad: *See—*
Schittko, Johannes; and Rauchenecker, Konrad, 4,112,375, Cl. 325-452.000.

Rauchle, Adolf: *See—*
Polony, Rudolf; Rauchle, Adolf; and Heizler, Fritz, 4,111,844, Cl. 252-106.000.

Rault, Daniel Raymond, to Societe Lorraine de Laminage Continu. Process for producing a metal sheet to be deep drawn or extra-deep drawn for the fabrication of shaped metal parts. 4,111,032, Cl. 72-366.000.

Raupach, Gerhard: *See—*
Affeldt, Karl-Heinz; and Raupach, Gerhard, 4,111,057, Cl. 73-709.000.

Rauscher, Herbert E., to Corning Glass Works. Composite glass articles for channel plate fabrication. 4,112,170, Cl. 428-212.000.

Rauscher, Walter: *See—*
Auracher, Franz; Zeitler, Karl-Heinz; and Rauscher, Walter, 4,111,522, Cl. 350-96.210.
Krueger, Hans; Mahlein, Hans F.; and Rauscher, Walter, 4,112,157, Cl. 428-1.000.

Ravn, Borge Andreas, to Moviefig APS. Changeable exhibitor comprising a video or script tape movable in a closed loop. 4,110,926, Cl. 40-485.000.

Raw, Peter Michael: *See—*
Bangay, Alan John; Raw, Peter Michael; Llewellyn, Rees Jenkin; and Gregory, Peter, 4,110,892, Cl. 29-420.000.

Ray Cook Golf Putters, Inc.: *See—*
Olson, Robert E.; and Braun, James R., 4,111,038, Cl. 73-65.000.

Ray, Leonard N., Jr.: *See—*
Buckwalter, Mervin R.; Bulson, Walter T.; Leininger, Larry W.; Posipanko, Thomas; and Ray, Leonard N., Jr., 4,111,646, Cl. 8-2.50A.

Raychem Corporation: *See—*
Dahl, Klaus J., 4,111,908, Cl. 528-361.000.

Raymond Lee Organization, Inc., The: *See—*
Epps, L. Macon, 4,112,281, Cl. 219-283.000.
Rizzotto, John D., Sr., 4,111,479, Cl. 296-23.0MC.

RCA Corporation: *See—*
D'Aiello, Robert Vincent, 4,112,457, Cl. 357-30.000.
Faulkner, Richard Dale, 4,112,325, Cl. 313-95.000.
Faulkner, Richard Dale, 4,112,326, Cl. 313-95.000.
Willis, Donald Henry, 4,112,465, Cl. 358-190.000.

Reagan, William Joseph: *See—*
Chen, Nai Yuen; Miale, Joseph Nicolas; and Reagan, William Joseph, 4,112,056, Cl. 423-329.000.

Rebstock, Mildred Catherine: *See—*
Wittle, Eugene Leroy; Rebstock, Mildred Catherine; Nicolaides, Ernest D.; and Campbell, Alfred, 4,111,923, Cl. 260-112.50R.

Rector, Douglas L.: *See—*
Callahan, William A.; Glenn, Eldridge Myles; and Rector, Douglas L., 4,112,100, Cl. 424-263.000.

Redemann, Carl T., to Dow Chemical Company, The. Preparation of 2,3,5-trichloropyridine. 4,111,938, Cl. 260-290.0HL.

Redmann, Jerome J.: *See—*
Hall, Freeman F., Jr.; and Redmann, Jerome J., 4,112,300, Cl. 250-330.000.

Redmond, John Peter: *See—*
Shirk, Albert; and Redmond, John Peter, 4,112,139, Cl. 427-54.000.

Reece, Thomas B.: *See—*
Dembiak, Matthew R.; Finnegan, John F.; Reece, Thomas B.; and Rudolph, Howard W., Jr., 4,112,247, Cl. 174-16.00R.

Regar, Karl-Nikolaus, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Auxiliary drive assembly for accelerating a vehicle. 4,110,982, Cl. 60-413.000.

Rege, Satish L.; and Woo, Beng-Yu, to Burroughs Corporation. Fast access charge coupled device memory organizations for a semiconductor chip. 4,112,504, Cl. 365-77.000.

Reghi, Gary A.; and Farina, Samuel T., to Oxy Metal Industries Corporation. Tannin treatment of aluminum with a fluoride cleaner. 4,111,722, Cl. 148-6.15R.

Regie Nationale des Usines Renault: *See—*
Dera, Alain, 4,110,847, Cl. 2-421.000.

Regnier, Gilbert; Canevari, Roger; and Poignant, Jean-Claude, to Science Union et Cie. 1-Naphthylmethyl-4-(thiazolyl-2)-piperazines. 4,112,092, Cl. 424-250.000.

Regueiro, Jose F., to Teledyne Industries, Inc. Internal combustion engine. 4,111,177, Cl. 123-32.0ST.

Reh, Lothar; Hirsch, Martin; and Plass, Ludolf, to Metallgesellschaft Aktiengesellschaft. Method of and apparatus for carrying out an exothermic process. 4,111,158, Cl. 122-4.00D.

Rehackova, Bozena: *See—*
Havel, Josef; Vobornik, Vaclav; Ripka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Planansky, Agaton; and Rehackova, Bozena, 4,110,961, Cl. 57-58.890.

Rehkopf, Charles H.: *See—*
Neuber, Ralph E.; and Rehkopf, Charles H., 4,111,507, Cl. 316-27.000.

Reiher, Max A. W.; and Faust, Richard C., to J. Ray McDermott & Co Diving bell handling system and method. 4,111,313, Cl. 214-15.00R

Reineke, Horst. Stayed ground mine, especially for rivers. 4,111,125, Cl 102-18.00R.

Reiner, Udo; and Hinrichsen, Gerhard, to Siemens Aktiengesellschaft. Digital correlation receiver. 4,112,498, Cl. 364-728.000.
Reiniger, Haigh M. Process for producing fused cellulose products. 4,111,744, Cl. 162-100.000.
Reinshagen, Hellmuth: *See—*
Nesvadba, Hans; and Reinshagen, Hellmuth, 4,112,091, Cl. 424-250.000.
Reis, Richard M., Sr.: *See—*
Zimmerman, John E.; and Reis, Richard M., Sr., 4,111,013, Cl. 69-21.000.
Reitano, Andrew. Exercising apparatus to aid in the practice of karate. 4,111,415, Cl. 272-94.000.
Remmington, Timothy Alan; and Robinson, William, to Imperial Chemical Industries Limited. Polymeric film production. 4,111,625, Cl. 425-174.80E.
Renckhoff, Gustav: *See—*
Hulsmann, Hans Leo; and Renckhoff, Gustav, 4,112,240, Cl. 560-112.000.
Rennard, Jean-Jacques Francois: *See—*
Duval, Jean-Claude; Mottini, Francis Joseph; Touron, Serge Auguste; Rennard, Jean-Jacques Francois; and Duval, Ruchela Marie, 4,112,505, Cl. 365-96.000.
Rentema, Albertus Pieter: *See—*
Boer, Melle; and Rentema, Albertus Pieter, 4,110,906, Cl. 30-43.920.
Rescalli, Carlo; and Pacifico, Antonio, to Snamprogetti, S.p.A. Method for removing acetylenic compounds from saturated, olefinic and dienic hydrocarbons or mixtures thereof. 4,112,009, Cl. 260-677.00A.
Research Corporation: *See—*
Harmening, Denise M., 4,112,070, Cl. 424-101.000.
Huber, Thomas L., 4,112,069, Cl. 424-93.000.
Restaino, Alfred Joseph, to ICI Americas Inc. Stabilized polymerizable polyester compositions. 4,112,019, Cl. 260-866.000.
Rexroad, James O.: *See—*
Nelson, Hugh A.; Schweinebraten, Raymond H.; Salemi, Nicholas A.; and Rexroad, James O., 4,112,269, Cl. 200-50.0AA.
Reynolds, Harold John, Jr., to Johns-Manville Corporation. Friction material for railroad disc brakes. 4,111,891, Cl. 260-38.000.
Rhone-Poulenc Industries: *See—*
Gruffaz, Max; and Locatelli, Jean-Louis, 4,111,919, Cl. 526-264.000.
Masotti, Robert; Biola, Georges; and Guerpillon, Henri, 4,111,662, Cl. 422-231.000.
Meiller, Francois, 4,112,185, Cl. 428-403.000.
Rhone-Poulenc S.A.: *See—*
Decor, Jean-Pierre, 4,111,998, Cl. 260-599.000.
Ricciardi, Ronald J.; Ferrara, Angelo; Hartmann, Joseph L.; and Lauterbach, Gary R., to Acrison, Incorporated, a part interest. Weigh feeding apparatus. 4,111,272, Cl. 177-50.000.
Rice, William J., to United States of America, National Aeronautics and Space Administration. Indicated mean-effective pressure instrument. 4,111,041, Cl. 73-115.000.
Richard, Joseph G. Adjustable windmill. 4,111,601, Cl. 416-41.000.
Richardson, Norman: *See—*
Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,111,804, Cl. 210-58.000.
Richmond, Michael Hugh: *See—*
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Richter, Marvin J. Method and apparatus for separating particulate materials of different specific gravities. 4,111,797, Cl. 209-14.000.
Richtzenhain, Hermann; and Schrage, Klaus, to Dynamit Nobel Aktiengesellschaft. Heptabromodibenzofuran, highly brominated dibenzofurans and the preparation and use thereof as flame retardants. 4,111,902, Cl. 260-45.80A.
Ricoh Co., Ltd.: *See—*
Iguchi, Susumi, 4,112,443, Cl. 354-31.000.
Kobayashi, Kazuo; Suzuki, Akira; Tanaka, Motoharu; Inaba, Norihiko; and Yuyama, Hisao, 4,111,823, Cl. 252-62.10P.
Ogawa, Mutsuo, 4,112,467, Cl. 358-257.000.
Sakamoto, Koji, 4,111,152, Cl. 118-7.000.
Yamauchi, Satoshi, 4,112,470, Cl. 360-88.000.
Riebel, Hans-Jochem: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammen, Ingeborg; and Homeyer, Bernhard, 4,112,080, Cl. 424-200.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,112,081, Cl. 424-200.000.
Riehe Corporation: *See—*
Summers, Kenneth L., 4,111,331, Cl. 220-319.000.
Rigali, Paul D. Window guard release. 4,111,477, Cl. 292-252.000.
Rikagaku Kenkyusho: *See—*
Goto, Eiichi; Soma, Takashi; and Idesawa, Masanori, 4,112,305, Cl. 250-492.00R.
Rini, Guy T.: *See—*
Carp, Ralph W.; Ang, Leoncio T.; and Rini, Guy T., 4,111,497, Cl. 303-110.000.
Rios, Donald J. Lamp-starting device. 4,112,336, Cl. 315-362.000.
Ripka, Josef: *See—*
Havel, Josef; Vobornik, Vaclav; Ripka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Planansky, Agaton; and Rehackova, Bozena, 4,110,961, Cl. 57-58.890.
Ripy, Howard W.: *See—*
Mangum, Norman W., Jr.; and Ripy, Howard W., 4,112,499, Cl. 364-732.000.
Rist, Bruno A.: *See—*
Tanner, James L.; and Rist, Bruno A., 4,112,377, Cl. 325-461.000.
Rite-Hite Corporation: *See—*
Neff, Robert O.; Grunwald, Lynn O.; Potter, Roderick B.; and Hahn, Norbert, 4,110,860, Cl. 14-71.700.
Rivera, Nilda Martinez: *See—*
Engler, Edward Martin; Nichols, Kenneth Herbert; Patel, Vishnubhai Vitthalbhai; Rivera, Nilda Martinez; and Schumaker, Robert Rhees, 4,111,857, Cl. 528-226.000.
Rizzotto, John D., Sr., to Raymond Lee Organization, Inc., The, a part interest. Vehicle top camper. 4,111,479, Cl. 296-23.0MC.
Robbins, William L.: *See—*
Krueger, Theodore H., Jr.; Eller, Robert; O'Brien, John; and Robbins, William L., 4,111,255, Cl. 164-255.000.
Robert Bosch GmbH: *See—*
Affeldt, Karl-Heinz; and Raupach, Gerhard, 4,111,057, Cl. 73-709.000.
Ehrmann, Karl; Gerber, Richard; and Doderer, Klaus, 4,111,168, Cl. 123-117.00A.
Kamin, Gerhard Robert, 4,112,463, Cl. 358-105.000.
Leiber, Heinz, 4,111,496, Cl. 303-92.000.
Mohr, Adolph, 4,112,320, Cl. 310-154.000.
Roozenbeek, Herman, 4,112,408, Cl. 338-32.00H.
Sauer, Rudolf; and Vogt, Dieter, 4,111,045, Cl. 73-228.000.
Roberts, Alvin V. Book with cover and method and apparatus for making the cover. 4,111,460, Cl. 281-29.000.
Roberts, Edward A. Exercising device for assisting a person to perform pullups. 4,111,414, Cl. 272-62.000.
Roberts, Herbert E.; and Wharff, Donald D. Franklin stove attachments. 4,111,182, Cl. 126-110.00B.
Roberts, Marvin E., to Roberts, Marvin E.; Ward, James E.; Roberts, Reid A.; and Kinkor, Charlene R. Key construction. 4,111,021, Cl. 70-406.000.
Roberts, Reid A.: *See—*
Roberts, Marvin E., 4,111,021, Cl. 70-406.000.
Roberts, Willard Lewis, to Beatrice Foods Co. Nutritionally balanced single food composition and method of production. 4,112,123, Cl. 426-72.000.
Robinson, Frank; and Whatmough, Nigel Stephen, to Courtaulds Limited. Sweater blank and method of knitting same. 4,111,008, Cl. 66-176.000.
Robinson, Frank; Girt, Keith Harry; and Whatmough, Nigel Stephen, to Courtaulds Limited. Knitting method and article for a body panel. 4,111,009, Cl. 66-189.000.
Robinson, Morris D. Platform lift. 4,111,317, Cl. 214-77.00P.
Robinson, William: *See—*
Remmington, Timothy Alan; and Robinson, William, 4,111,625, Cl. 425-174.80E.
Roccaforte, Harry I., to Champion International Corporation. Self-contained baking tray carton. 4,111,306, Cl. 206-611.000.
Roch, Gerald V.; and Hadley, Chris L., to Hurco Manufacturing Company Inc. Twin motor and screw drive for workpiece positioning stops and for press ram drive and the like. 4,112,493, Cl. 364-476.000.
Rocha, James; and Carter, L. Dean. Limited access wire stripper. 4,111,076, Cl. 81-9.50A.
Rockerath, John L.; and Schreck, Harold J., to Cluett, Peabody & Co. Inc. Sewing machine material preassembly system. 4,111,138, Cl. 112-141.000.
Rockwell International Corporation: *See—*
Dorsman, Adrian K., 4,112,428, Cl. 340-347.0NT.
Gelnett, Leland E., 4,111,223, Cl. 137-115.000.
Heimbigner, Gary L.; and Booher, Robert K., 4,112,296, Cl. 307-279.000.
Hodson, Donald R., 4,111,067, Cl. 74-572.000.
Rodot, Frederic B. Method of transferring passengers from vehicles to a station. 4,111,130, Cl. 104-28.000.
Roe, Anthony Maitland: *See—*
Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, 4,111,935, Cl. 544-224.000.
Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, 4,111,936, Cl. 544-239.000.
Roge, Ralph R.; Ziermann, Mark S.; and Wilkis, Anthony J., to Wescom, Inc. Miniature multi-impedance transformer module. 4,112,481, Cl. 361-395.000.
Rohbock, Klaus; Wiemers, Rudolf; Woditsch, Peter; and Thiel, Reinhard, to Bayer Aktiengesellschaft. Process for regenerating spent vanadium oxide containing oxidation catalysts. 4,111,832, Cl. 252-412.000.
Rohe, Lothar: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Hammen, Ingeborg; and Homeyer, Bernhard, 4,112,080, Cl. 424-200.000.
Rohm GmbH: *See—*
Boessler, Hanns; and Rauch, Hubert, 4,112,215, Cl. 528-503.000.
Rohm and Haas Company: *See—*
Hurt, William S., 4,112,083, Cl. 424-215.000.
Rohr Industries, Inc.: *See—*
Koss, Muriel L., 4,112,164, Cl. 428-116.000.
Rohrbach, Peter H., to Harris Corporation. Adhesive dispensing apparatus for card tipper. 4,111,153, Cl. 118-7.000.
Rohweder, Theodore Richard: *See—*
Hannes, George John; Rohweder, Theodore Richard; Dreikorn, Hans Wendell; and Shepherd, Philip Bickford, 4,112,174, Cl. 428-220.000.
Roiko, Russell A., to Minnesota Mining and Manufacturing Company. Cable connecting station. 4,110,896, Cl. 29-566.300.

Rokach, Joshua: *See—*
Rooney, Clarence Stanley; Rokach, Joshua; and Atkinson, Joseph George, 4,112,112, Cl. 424-274.000.

Roldan, Cristobal Martinez: *See—*
Jarque, Ricardo Granados; Cartes, Juan Bosch; Cabiro, Jorge Canals; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,111,945, Cl. 260-297.00R.

Rolnick, Edward M., to Gulf & Western Manufacturing Company. Combination tap and die wrench. 4,111,591, Cl. 408-117.000.

Roman, Stephan; and Spitko, Richard J., to Boeing Company, The. Composite hingeless rotor hub for rotary wing aircraft. 4,111,605, Cl. 416-141.000.

Ronnholm, Arvi. Method of recovering heat as well as fractions containing volatile alcohols and sulphur compounds from black liquor in connection with pulping. 4,111,743, Cl. 162-16.000.

Rooney, Clarence Stanley; Rokach, Joshua; and Atkinson, Joseph George, to Merck & Co., Inc. Pyrrolo[2,1-b] [3]benzazepines useful for producing a skeletal muscle relaxing or tranquilizing effect. 4,112,112, Cl. 424-274.000.

Roozenbeek, Herman, to Robert Bosch GmbH. Device for producing an electrical pulse in response to passage of a magnetically conducting member through an air gap. 4,112,408, Cl. 338-32.00H.

Rosche, Paul: *See—*
Ederer, Georg; Fischer, Adolf; Rosche, Paul; Troll, Helmar; Wurst, Wolfgang; Hengl, Helmut; and Seidl, Jiri, 4,111,163, Cl. 123-52.00M.

Roscoe Brown Corporation: *See—*
Brown, Stanley L., 4,110,920, Cl. 37-97.000.

Rosen, Perry: *See—*
Holland, George William; Jernow, Jane Liu; and Rosen, Perry, 4,112,225, Cl. 542-426.000.

Rosenberger, Michael, to Hoffmann-La Roche Inc. Preparation of food coloring agents. 4,111,992, Cl. 260-586.00R.

Rosenfeld, Jerome E. Dry transfer product and process for using same. 4,111,734, Cl. 156-234.000.

Rosenkranz, Hans Jurgen: *See—*
Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Fischler, Hans-Michael; and Eimers, Erich, 4,112,018, Cl. 260-861.000.

Rosenstock, Guenter: *See—*
Kattner, Erich; and Rosenstock, Guenter, 4,112,435, Cl. 346-140.00R.

Roskam, Willem Gerrit. Apparatus for preparative electrophoresis. 4,111,785, Cl. 204-299.00R.

Ross, Donald K.; and Wright, Wallace A., Jr. Flat plate solar collector. 4,111,186, Cl. 126-271.000.

Ross, Douglas: *See—*
Blackburn, Keith; and Ross, Douglas, 4,111,273, Cl. 180-14.00R.

Ross Operating Valve Co.: *See—*
Cameron, Russell J., 4,111,226, Cl. 137-269.000.

Rossi, Alberto: *See—*
Baschang, Gerhard; Sele, Alex; Stanek, Jaroslav; and Rossi, Alberto, 4,112,075, Cl. 424-180.000.
Haas, Georges; and Rossi, Alberto, 4,112,099, Cl. 424-263.000.

Roth, Nathan, to Alza Corporation. Cartoned medical instrument package. 4,111,302, Cl. 206-363.000.

Rothenberger GmbH Werkzeuge und Maschinen KG: *See—*
Rothenberger, Gunther, 4,111,661, Cl. 422-117.000.

Rothenberger, Gunther, to Rothenberger GmbH Werkzeuge und Maschinen KG. Oxygen generator with cartridge holder for oxygen-yielding cartridges. 4,111,661, Cl. 422-117.000.

Rothman, Edward A.; and Carlson, Charles E. K., to United Technologies Corporation. Breakaway fan blade. 4,111,600, Cl. 416-2.000.

Rottenkolber, Hans; and Steinbichler, Hans, to OPTO Produkte AG. Method for the optical determination and comparison of shapes and positions of objects, and arrangement for practicing said method. 4,111,557, Cl. 356-168.000.

Roudebush, Allen T.; and Thompson, Kenneth P., to Champion International Corporation. Concrete module unit. 4,112,173, Cl. 428-215.000.

Roussel Uclaf: *See—*
Dumont, Claude; and Oberlander, Claude, 4,112,093, Cl. 424-250.000.
Martel, Jacques; and Tessier, Jean, 4,111,994, Cl. 260-586.00R.
Pavan, Charles; and Bulidon, Jacques, 4,111,993, Cl. 260-586.00R.

Rousset, Abel Claude: *See—*
Paris, Rene Antoine; Amblard, Paul Alexis; and Rousset, Abel Claude, 4,111,686, Cl. 75-0.50A.

Routh, Donald E.: *See—*
Hollis, Ben R., Jr.; Feltner, William R.; Bouldin, David L.; and Routh, Donald E., 4,111,775, Cl. 204-192.00C.

Rowlands, Tom: *See—*
Molins, Desmond Walter; and Rowlands, Tom, 4,111,740, Cl. 156-498.000.

Rubashev, Grigory Markovich; Alperovich, Vladislav Ruvimovich; and Lazovsky, Jury Iosifovich. Contactless switch for regulating taps of induction electric machines. 4,112,348, Cl. 323-43.50S.

Rubino, Andrew M.; and Margres, Jack J., to Armour Pharmaceutical Company. Resuspendable dried antacids. 4,112,072, Cl. 424-155.000.

Ruckdeschel, Frederick R., to Xerox Corporation. Multi-particle developability regulating system. 4,111,151, Cl. 118-7.000.

Ruder, Nils, to Normark Corporation. Hand compasses. 4,110,914, Cl. 33-355.00D.

Rudolph, Hans: *See—*
de Cleur, Eckhard; Dhein, Rolf; Rudolph, Hans; and Kreuder, Hans Joachim, 4,112,012, Cl. 260-835.000.

Rudolph, Howard W., Jr.: *See—*
Dembiak, Matthew R.; Finnegan, John F.; Reece, Thomas B.; and Rudolph, Howard W., Jr., 4,112,247, Cl. 174-16.00R.

Ruhf, Truman J., to GAF Corporation. Water based ink composition for vinyl flooring. 4,111,878, Cl. 260-29.6ME.

Runyon, John F. Hinge joint assembly. 4,111,574, Cl. 403-54.000.

Russell, Malcolm Clifford, to Russell Manufacturing Company. X-ray film mount. 4,112,165, Cl. 428-134.000.

Russell Manufacturing Company: *See—*
Russell, Malcolm Clifford, 4,112,165, Cl. 428-134.000.

Rutherford, Arthur J., to Owens-Illinois, Inc. High speed method of and apparatus for similarly orienting articles. 4,111,295, Cl. 198-399.000.

Ryden, William Dennis: *See—*
Bindell, Jeffrey Bruce; Holschwandner, Lowell Henry; Labuda, Edward Franklin; and Ryden, William Dennis, 4,111,783, Cl. 204-298.000.

Rys, Tadeusz J. Means connecting circuit breaker and auxiliary feature modules. 4,112,270, Cl. 200-50.00C.

S.p.r.L. Limatex: *See—*
Periers, Gilbert, 4,111,733, Cl. 156-204.000.

S.U.B. Societa Utilizzazione Brevetti S.r.l.: *See—*
Cisterni, Leandro, 4,112,145, Cl. 427-274.000.

Saarbergwerke Aktiengesellschaft: *See—*
Leibrock, Kurt, 4,111,664, Cl. 44-10.00G.

Sabel, Hans-Dieter: *See—*
Sextro, Gunter; Burg, Karlheinz; Schlaf, Helmut; Sabel, Hans-Dieter; and Heller, Alwin, 4,111,912, Cl. 528-45.000.

Sadak, John C.: *See—*
Chen, Edward S.; Sadak, John C.; and Lakshminarayanan, G. Raman, 4,111,760, Cl. 204-26.000.

Sagata, Shinsuke: *See—*
Inayoshi, Akio; Ito, Toshimichi; Nagatoshi, Kikuo; Nara, Toshihide; Sagata, Shinsuke; Tomari, Hitomi; Fujimoto, Noriki; and Kaji, Hidehiko, 4,111,898, Cl. 260-42.530.

Sage, Gerald F.: *See—*
Ewanus, Walter; and Sage, Gerald F., 4,112,368, Cl. 325-32.000.

Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, to Toyama Chemical Co., Ltd. Novel penicillins and cephalosporins and process for producing the same. 4,112,090, Cl. 424-251.000.

Saindon, Richard R.: *See—*
Parker, Roy B.; and Saindon, Richard R., 4,112,037, Cl. 264-126.000.

Saint-Gobain Industries: *See—*
Battigelli, Jean A.; and Barthe, Marie-Pierre, 4,111,672, Cl. 65-3.00C.

St. Jean, Herbert N., to Arrowhead Enterprises, Inc. Apparatus orientating arrangement. 4,111,390, Cl. 248-274.000.

Saito, Ritaro: *See—*
Sanada, Hisao; Saito, Ritaro; Funabashi, Masayuki; Inada, Kazuyoshi; and Seguchi, Koji, 4,112,053, Cl. 423-239.000.

Sakagami, Teruo: *See—*
Murayama, Naohiro; Fukuda, Makoto; Sakagami, Teruo; Suzuki, Shirou; Kokubu, Yoshikazu; and Enoki, Toshio, 4,111,780, Cl. 204-266.000.

Sakamoto, Koji, to Ricoh Co., Ltd. Electrostatographic apparatus comprising improved development bias means. 4,111,152, Cl. 118-7.000.

Sakamoto, Tomio: *See—*
Miyake, Tetsuya; Seko, Maomi; Inada, Kohji; Ochi, Kazushi; and Sakamoto, Tomio, 4,112,044, Cl. 423-7.000.

Sakazaki, Mamoru: *See—*
Jaidinger, John H.; and Sakazaki, Mamoru, 4,112,400, Cl. 335-128.000.

Sakazume, Akio; Iwata, Hiroshi; Nakamura, Hiroo; Ogawa, Hiroyuki; Kashiwazaki, Susumu; and Nakao, Saneaki, to Hitachi, Ltd. Room air conditioner. 4,111,000, Cl. 62-262.000.

Sakemoto, Mitsuhiro: *See—*
Ichinose, Isao; Sakemoto, Mitsuhiro; and Suzuki, Noboru, 4,111,323, Cl. 215-230.000.

Sako, Kiyohide: *See—*
Tsunoda, Kozo; Sowa, Tsuneo; Iitsuka, Kunio; and Sako, Kiyohide, 4,112,221, Cl. 536-24.000.

Sakurazawa, Hatuo. Wheat flour product manufacturing equipment. 4,111,109, Cl. 99-353.000.

Salditt, Ferdinand; and Hansen, William L., to Minnesota Mining and Manufacturing Company. Porous adhesive tape. 4,112,177, Cl. 428-304.000.

Salemi, Nicholas A.: *See—*
Nelson, Hugh A.; Schweinebraten, Raymond H.; Salemi, Nicholas A.; and Rexroad, James O., 4,112,269, Cl. 200-50.0AA.

Salsich, Robert Charles; and Bartell, Roger Edwin, to Eastman Kodak Company. Thermal processor. 4,112,280, Cl. 219-216.000.

Sam, Donnie Joe, to Du Pont de Nemours, E. I., and Company. Substituted dioxolanes and photosensitive and degradable polymers useful in imaging. 4,111,960, Cl. 260-340.90R.

Samuel Moore and Company: *See—*
Kavick, Edward M., 4,111,469, Cl. 285-256.000.

Sanada, Hisao; Saito, Ritaro; Funabashi, Masayuki; Inada, Kazuyoshi; and Seguchi, Koji, to Kureha Kagaku Kogyo Kabushiki Kaisha. Dry method for the denitrification of exhaust gas containing nitrogen oxides. 4,112,053, Cl. 423-239.000.

Sander, Bruno; Bonitz, Eckhard; and Scherling, Kurt, to BASF Aktien-

gesellschaft. Manufacture of fibrids of polyolefins. 4,112,029, Cl. 264-11.000.

Sanders Associates, Inc.: *See—*
Stevens, Robert R., 4,112,496, Cl. 364-728.000.

Sanders, Dieter: *See—*
Brokmann, Manfred; Sanders, Kurt; Sanders, Dieter; and Westhoff, Hermann, 4,112,163, Cl. 428-107.000.

Sanders, Kurt: *See—*
Brokmann, Manfred; Sanders, Kurt; Sanders, Dieter; and Westhoff, Hermann, 4,112,163, Cl. 428-107.000.

Sando Iron Works Co., Ltd.: *See—*
Sando, Yoshikazu; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,111,434, Cl. 277-3.000.

Sando, Yoshikazu; Ishidoshiro, Hiroshi; and Minakata, Matsuo, to Sando Iron Works Co., Ltd. Method of pressure seal simultaneously employing air-balance of a high pressure steamer and an apparatus therefor. 4,111,434, Cl. 277-3.000.

Sandow, Louis W. Mixing catalyst and carrier gas for curing foundry molds and cores. 4,112,515, Cl. 366-17.000.

Sandoz, Inc.: *See—*
Anderson, Paul L.; and Oglia, Thomas F., 4,112,117, Cl. 424-304.000.
Nadelson, Jeffrey, 4,112,108, Cl. 424-272.000.

Sandoz Ltd.: *See—*
Bormann, Gerhard; and Berthold, Richard, 4,112,111, Cl. 424-274.000.
Meybeck, Jacques, 4,111,930, Cl. 260-207.500.
Nesvadba, Hans; and Reinshagen, Hellmuth, 4,112,091, Cl. 424-250.000.

Sandstrom, Wayne. Water distribution system. 4,111,224, Cl. 137-207.000.

Sanfilippo, Domenico; and Morelli, Morello, to ANIC S.p.A. Selective hydrogenation in gaseous phase of cyclopentadiene or a mixture of ethylene and acetylene using a palladium zinc catalyst deactivated with ammonia, ammonium chloride, steam, or their mixtures. 4,112,007, Cl. 260-666.00A.

Saniga, George T.: *See—*
Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,111,759, Cl. 203-7.000.

Sano, Akira: *See—*
Inoue, Sho; Sano, Akira; and Kitaguchi, Koji, 4,112,218, Cl. 536-5.000.

Sarhan, Ali: *See—*
Wulff, Gunter; and Sarhan, Ali, 4,111,863, Cl. 521-63.000.

Sartori, Guido; and Leder, Frederic, to Exxon Research & Engineering Co. Process for removing carbon dioxide containing acidic gases from gaseous mixtures using a basic salt activated with a hindered amine. 4,112,050, Cl. 423-223.000.

Sartori, Guido; and Leder, Frederic, to Exxon Research & Engineering Co. Process and amine-solvent absorbent for removing acidic gases from gaseous mixtures. 4,112,051, Cl. 423-223.000.

Sartori, Guido; and Leder, Frederic, to Exxon Research & Engineering Co. Process for removing carbon dioxide containing acidic gases from gaseous mixtures using aqueous amine scrubbing solutions. 4,112,052, Cl. 423-228.000.

Satake, Akinori: *See—*
Shirai, Yujiro; and Satake, Akinori, 4,112,434, Cl. 346-33.0ME.

Satake, Eiichi: *See—*
Funakoshi, Yoshiro; Asogawa, Tatsuo; Satake, Eiichi; Motoyama, Shimesu; Yamada, Shuri; and Kakukawa, Morio, 4,111,626, Cl. 425-203.000.

Sato, Kenji: *See—*
Hayashi, Kiyozumi; and Sato, Kenji, 4,111,748, Cl. 176-68.000.

Sato, Kuniaki; Nakamura, Yoshihiro; and Ninomiya, Hideaki, to Kajima Corporation; and Hitachi Metals. Fittings for connecting columns and beams of steel frame construction. 4,111,578, Cl. 403-189.000.

Sato, Masamichi, to Fuji Photo Film Co., Ltd. Spin-coated photosensitive silver halide photomask. 4,111,698, Cl. 96-79.000.

Sato, Mitsuo; Miyagawa, Norio; and Kobayashi, Juichi, to Mitsubishi Rayon Co., Ltd. Metallized plastic molding. 4,112,190, Cl. 428-457.000.

Satterlee, Lowell D., to University of Nebraska, Board of Regents of the. Extraction of protein from *Phaseolus aureus, Phaseolus vulgaris* and *Phaseolus lunatus* beans using sodium chloride. 4,111,927, Cl. 260-123.500.

Saucy, Gabriel: *See—*
Cohen, Noal; and Saucy, Gabriel, 4,111,961, Cl. 260-345.80R.

Sauer, Rudolf; and Vogt, Dieter, to Robert Bosch GmbH. Air flow meter. 4,111,045, Cl. 73-228.000.

Sauerland, Franz Ludwig: *See—*
Buynak, Gabriel Ralph; and Sauerland, Franz Ludwig, 4,112,134, Cl. 427-10.000.

Sawada, Takashi: *See—*
Asano, Teryoshi; Fukuoka, Sadao; and Sawada, Takashi, 4,111,464, Cl. 285-111.000.

Sawada, Yoshio: *See—*
Kawasaki, Masahiro; and Sawada, Yoshio, 4,112,439, Cl. 354-23.00D.

Saxelin, Ilpo: *See—*
Jolanki, Jorma; Saxelin, Ilpo; and Ponni, Hannu, 4,111,560, Cl. 356-205.000.

Saylor, Lee H., to Sealed Power Corporation. Oil control ring spacer-expander with improved slip latch. 4,111,437, Cl. 277-139.000.

Sbarra, Frank; and Spector, George. Eye drop dispenser. 4,111,200, Cl. 128-233.000.

Schade, Gerhard: *See—*
Bier, Gerhard; Blaschke, Franz; aus der Funten, Helmut; and Schade, Gerhard, 4,111,921, Cl. 528-338.000.

Schaeffer, James Robert; Snoke, Roy Eugene; and Harris, Harry Wayne, to Eastman Kodak Company. Composition for chromatography. 4,111,838, Cl. 252-430.000.

Schafft, Hugo Willy, to Motorola, Inc. High stiffness speaker cone. 4,112,168, Cl. 428-198.000.

Schantz, Spencer C. Compact fail-safe buzzer. 4,112,402, Cl. 335-252.000.

Scharfe, Gerhard: *See—*
Martin, Manfred; Schmidt, Walter; and Scharfe, Gerhard, 4,111,967, Cl. 260-396.00R.

Schatz Federal Bearings Co., Inc.: *See—*
McAllister, William D.; and Rajczi, Frank D., 4,110,883, Cl. 29-148.40S.

Scherbing, Frank J., to Chicago Lock Co. Pick-resistant axial split-pin tumbler-type lock mechanism. 4,111,020, Cl. 70-363.000.

Schering Aktiengesellschaft: *See—*
Nusslein, Ludwig; and Pieroh, Ernst Albrecht, 4,112,107, Cl. 424-270.000.
Plum, Hans; and Schroeer, Ulrich, 4,112,084, Cl. 424-226.000.

Scherling, Kurt: *See—*
Sander, Bruno; Bonitz, Eckhard; and Scherling, Kurt, 4,112,029, Cl. 264-11.000.

Scheuneman, James Herman, to Sperry Rand Corporation. Conditional bypass of error correction for dual memory access time selection. 4,112,502, Cl. 364-900.000.

Schittko, Johannes; and Rauchenecker, Konrad, to Siemens Aktiengesellschaft. Tunable selective super heterodyne receiver. 4,112,375, Cl. 325-452.000.

Schlaf, Helmut: *See—*
Sextro, Gunter; Burg, Karlheinz; Schlaf, Helmut; Sabel, Hans-Dieter; and Heller, Alwin, 4,111,912, Cl. 528-45.000.

Schlaf, Richard A.: *See—*
Bistrick, Eugene J.; Miller, Stewart F.; Abrahamsson, Axel B.; and Schlaf, Richard A., 4,111,586, Cl. 407-16.000.

Schlax, Timothy R.: *See—*
Tsuha, Wallace K.; and Schlax, Timothy R., 4,112,429, Cl. 340-365.00R.

Schleifstein, Robert, to Coats & Clark, Inc. Method for making fire retardant zipper. 4,111,647, Cl. 8-4.000.

Schlumberger Technology Corporation: *See—*
Elliott, J. Kelly; and Crawford, Douglas W., 4,111,608, Cl. 417-112.000.

Schmerling, Louis, to UOP Inc. Transesterification of carboxylic acids. 4,112,235, Cl. 560-1.000.

Schmidlin, Albertus E., to United States of America, Army. Centrifugal rolling ball locking device. 4,111,127, Cl. 102-237.000.

Schmidt, Dietrich: *See—*
Lang, Winfried; Schmidt, Dietrich; Hofer, Johann; Pachnek, Rudolf; and Rath, Heinz-Jorg, 4,112,057, Cl. 423-342.000.
Rath, Heinz-Jorg; Schmidt, Dietrich; and Zulehner, Werner, 4,111,742, Cl. 156-617.0SP.

Schmidt, Ferenc J., to Ametek, Inc. Method of separating solids from a fluid system. 4,111,768, Cl. 204-151.000.

Schmidt, Ingo, to Thomas GmbH. Mounting cup for aerosol valves. 4,111,339, Cl. 222-394.000.

Schmidt, Joachim; Weigelt, Christian; Bamberg, Wolfgang; and Schneider, Wolfgang, to V E B Jenapharm. Lithium pantoate and optically active isomers thereof and process of making the same. 4,111,987, Cl. 562-401.000.

Schmidt, John Kenneth, to Amcord, Inc. Rotary seal. 4,111,439, Cl. 277-153.000.

Schmidt, Stephen R., to Copar Corporation. Jam detector. 4,112,379, Cl. 328-5.000.

Schmidt, Walter: *See—*
Martin, Manfred; Schmidt, Walter; and Scharfe, Gerhard, 4,111,967, Cl. 260-396.00R.

Schnadt, Robert: *See—*
Arzubi, Luis Maria; Gschwendtner, Joerg; and Schnadt, Robert, 4,112,512, Cl. 365-203.000.

Schneider, Georg: *See—*
Kutzner, Willi Albert Peter; and Schneider, Georg, 4,111,122, Cl. 101-228.000.

Schneider, Hans-Georg: *See—*
Hippchen, Hermann; Schneider, Hans-Georg; and Schwingeler, Renate, 4,111,714, Cl. 127-46.00A.

Schneider, Louis; and Graham, David E., to GAF Corporation. Mononitrotrifluoromethyl diphenylethers. 4,112,002, Cl. 260-612.00R.

Schneider, Michael. Hydraulic boring device. 4,111,468, Cl. 285-190.000.

Schneider, Rolf. Rotary piston engine using electric heating to flash motive fluid. 4,110,984, Cl. 60-509.000.

Schneider, Wolfgang: *See—*
Schmidt, Joachim; Weigelt, Christian; Bamberg, Wolfgang; and Schneider, Wolfgang, 4,111,987, Cl. 562-401.000.

Schnitzler, Hanns. Multi-zone drilling system with spiral drills and quick adjustment for flat and deep drillings at a minimum jutting-out length of the drill attachment. 4,111,592, Cl. 408-197.000.

Scholten, Joseph J. F.: *See—*
van Montfoort, Abraham; and Scholten, Joseph J. F., 4,111,842, Cl. 252-447.000.

Schrage, Klaus: *See—*
Richtzenhain, Hermann; and Schrage, Klaus, 4,111,902, Cl. 260-45.80A.
Schreck, Harold J.: *See—*
Rockerath, John L.; and Schreck, Harold J., 4,111,138, Cl. 112-141.000.
Schreiber, Ronald E.; and Christensen, La Mon D. Arrow and arrow attachment. 4,111,424, Cl. 273-106.50C.
Schroder, Hubert; and Klein, Werner, to Glaswerk Schott & Gen. Method for the production of light-reflecting layers on a surface of a transparent glass article. 4,112,142, Cl. 427-166.000.
Schroeder, Merrill W., to Pol, Gerrit Vander. Herbicide applying machine. 4,111,364, Cl. 239-77.000.
Schroeer, Ulrich: *See—*
Plum, Hans; and Schroeer, Ulrich, 4,112,084, Cl. 424-226.000.
Schrotter, Wolfgang Adalbert: *See—*
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Scott, Walter W., deceased, 4,111,640, Cl. 431-46.000.
Scott Paper Company: *See—*
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Scott, Robert K. Instant open goose and duck pit cover. 4,110,941, Cl. 52-66.000.
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Seal Incorporated: *See—*
Krueger, Theodore H., Jr.; Eller, Robert; O'Brien, John; and Robbins, William L., 4,111,255, Cl. 164-255.000.
Sealed Air Corporation: *See—*
Sperry, Charles Richard, 4,111,613, Cl. 417-394.000.
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Seefried, Carl G., Jr.; Whitman, Robert D.; and Van Cleve, Russell, to Union Carbide Corporation. Polymer/polyols and polyurethane forms and elastomers therefrom. 4,111,865, Cl. 521-137.000.
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Seiler, William, Jr., to David Kopf Instruments. Notched tubular cutting instrument. 4,111,207, Cl. 128-305.000.
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Seko, Maomi; Ogawa, Shinsaku; Ajiki, Nobuo; and Yoshida, Muneo, to Asahi Kasei Kogyo Kabushiki Kaisha. Bipolar system electrolytic cell. 4,111,779, Cl. 204-255.000.
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Buckholdt, Robert E., 4,111,644, Cl. 432-179.000.
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Selig, Thomas R.; Yasar, Tugrul; and Coulton, Derek A., to National Micronetics, Inc. Beam lead arrangement for microelectronic devices. 4,112,196, Cl. 428-594.000.
Seliger, Robert L.; and Ward, James W., to United States of America, Navy. Field-effect transistor with extended linear logarithmic transconductance. 4,112,455, Cl. 357-23.000.
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Selman, Charles M., to Phillips Petroleum Company. Lithium alkenoxides in preparation of functional liquid conjugated diene polymers. 4,111,915, Cl. 528-58.000.
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Schulz, Johann G. D.; Selwitz, Charles M.; and Onopchenko, Anatoli, 4,111,824, Cl. 252-63.000.
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Semple, Alexander M., to Ranco Incorporated. Oven control. 4,111,358, Cl. 236-15.00A.
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Nakamura, Kenji; and Seno, Iwao, 4,111,533, Cl. 350-337.000.
Sera, Hidefumi; Shiraishi, Hisashi; and Ishii, Tsumoru, to Fuji Photo Film Co., Ltd. Hardening agent for gelatin and method for hardening gelatin. 4,111,926, Cl. 260-117.000.
Sessa, Terenzio. Cable-actuated, car-side-window-lifting mechanism. 4,110,935, Cl. 49-352.000.
Seuter, Friedel: *See—*
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Sforza, Pasquale M. Fluid flow energy conversion systems. 4,111,594, Cl. 415-1.000.
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Shade, Steven F.: *See*—
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Shai, Michael Charles, to United States of America, National Aeronautics and Space Administration. Electrically conductive thermal control coatings. 4,111,851, Cl. 252-518.000.
Shair, Salem A.; Paul, Stewart N.; and Cairns, James E., to Chemed Corporation. Polyquaternary compounds for the control of microbiological growth. 4,111,679, Cl. 71-67.000.
Shaner, Jay R.; and Edelman, Robert, to Celanese Corporation. Reinforced polyoxymethylene molding composition capable of forming composite articles exhibiting improved physical properties. 4,111,887, Cl. 260-37.0AL.
Shanto, Albert J.; and Bevins, Bruce V. Smoking pipe. 4,111,213, Cl. 131-173.000.
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Sharpe, Cecil H., to General Motors Corporation. Fuel nozzle. 4,111,369, Cl. 239-400.000.
Shaw, Robert F. Apparatus and method for examining blood vessels of interest by tracking position with respect to time of particles introduced therein. 4,111,191, Cl. 128-2.05F.
Sheahan, James P., to Dow Chemical Company, The. Roof installation for locating water leakage points. 4,110,945, Cl. 52-173.00R.
Sheiko, Ivan Vasilievich: *See*—
Lakomsky, Viktor Iosifovich; Sheiko, Ivan Vasilievich; Grigorenko, Georgy Mikhailovich; Torkhov, Gennady Fedorovich; Trigub, Vladimir Kirillovich; Korotkov, Albert Nikitovich; Kurganov, Viktor Mikhailovich; Moshkevich, Evgeny Isaevich; Pakhomov, Alexei Ivanovich; and Verkhovtsev, Emil Vasilievich, 4,112,246, Cl. 13-2.00P.
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Gergen, William P.; and Davison, Sol, 4,111,894, Cl. 260-40.00R.
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Muijs, Herman M., 4,111,819, Cl. 252-8.900.
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Shepard, Lynn R.; and Terrell, John B., to Teledyne Industries, Inc. Press cushion. 4,111,030, Cl. 72-351.000.
Shepherd, Philip Bickford: *See*—
Hannes, George John; Rohweder, Theodore Richard; Dreikorn, Hans Wendell; and Shepherd, Philip Bickford, 4,112,174, Cl. 428-220.000.
Sheppard, William L., to AVM Corporation. Butterfly valve. 4,111,395, Cl. 251-306.000.
Sheridon, Nicholas K., to Xerox Corporation. Projection system of high efficiency. 4,111,538, Cl. 353-122.000.
Sherman, Clarence A., to McDermid, Terry. Air operated hydraulic pump apparatus. 4,110,983, Cl. 60-477.000.
Sherwin, Walter M., to General Motors Corporation. Circuit for energizing a fuel injector valve coil. 4,112,477, Cl. 361-155.000.
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Shiff, Milo B., to Anaconda Company, The. Key telephone system and method. 4,112,261, Cl. 179-99.000.
Shima, Takesaburo; Kozima, Hiroshi; Yoshida, Tomio; and Nakamura, Joji, to Sumitomo Naugatuck Co., Ltd. Process for producing thermoplastic resin. 4,112,021, Cl. 260-880.00R.
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Shimono, Yukio: *See*—
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Shiomi, Kozen; and Shimizu, Ryoichi, to Toyo Soda Manufacturing Co., Ltd.; and Japan Steel Works Limited, The. Multi-core rotary circular die. 4,111,630, Cl. 425-462.000.
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Yukinaga, Hisajiro; Sumimoto, Shinzaburo; Ishizuka, Ichiro; and Sugita, Jitsuo, 4,111,680, Cl. 71-88.000.
Shirai, Yujiro; and Satake, Akinori, to Shirai, Yujiro. Biorhythm chart drawing-up apparatus. 4,112,434, Cl. 346-33.0ME.
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Shirk, Albert; and Redmond, John Peter, to AMP Incorporated. Process for rendering kapton or other polyimide film photo sensitive to catalyst for the deposition of various metals in pattern thereon. 4,112,139, Cl. 427-54.000.
Shore, Frank. Presentation-frame and backing units pad. 4,110,923, Cl. 40-152.000.
Shoup, Floyd K.: *See*—
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Shoup, Robert D.: *See*—
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Shultz, Andrew; and Stepan, F. Quinn, to Stepan Chemical Company. Particulate composition of sodium alpha olefin sulfonate and sodium silicate. 4,111,853, Cl. 252-536.000.
Sick, Hans-Hermann; and Habel, Erich, to Carl Freudenberg, Firma. Self-arresting sealing ring. 4,111,441, Cl. 277-183.000.
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Siemens Aktiengesellschaft: *See*—
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Bergmann, Horst, 4,112,360, Cl. 324-80.000.
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Eggert, Hans Joachim; Oberberger, Otto; Zenkert, Heinrich; and Kuehne, Rudi, 4,111,328, Cl. 220-4.00R.
Elsner, Peter, 4,112,513, Cl. 365-222.000.
Hofer, Ernst; and Wintzer, Klaus, 4,112,426, Cl. 340-347.00C.
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Huettner, Robert; and Kuetterer, Gerhard, 4,112,304, Cl. 250-476.000.
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Kattner, Erich; and Rosenstock, Guenter, 4,112,435, Cl. 346-140.00R.
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Krueger, Hans; Mahlein, Hans F.; and Rauscher, Walter, 4,112,157, Cl. 428-1.000.
Olsen, Willi; and Pircher, Christian, 4,112,473, Cl. 361-1.000.
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Schittko, Johannes; and Rauchenecker, Konrad, 4,112,375, Cl. 325-452.000.
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Veith, Werner; and Bechteler, Martin, 4,112,332, Cl. 315-169.0TV.
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Signatron, Inc.: *See*—
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Signetics Corporation: *See*—
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Sigott, Siegfried; Suessenbeck, Heinrich; Zitz, Alfred; and Siebenhofer, Gottfried, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Pressure relief valve for hydraulic mine supporting elements. 4,111,227, Cl. 137-469.000.
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Simionescu, Radu, to Institutul Oncologic Bucuresti. Respiratory valve, especially for anaesthetic circuits. 4,111,228, Cl. 137-512.000.
Simons, James Brandon, to Celanese Polymer Specialties Company. Controlled reactivity epoxy resin compositions. 4,111,909, Cl. 528-123.000.
Simons, Steven R. Percussion instrument mounting apparatus. 4,111,095, Cl. 84-422.00R.

Simpson, Howard D., to Union Oil Company of California. Hydrodesulfurization of hydrocarbon with cobalt-molybdenum-alumina catalyst of high metal content and high surface area. 4,111,795, Cl. 208-216.000.

Singer Company, The: *See—*
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Peters, David L., 4,112,500, Cl. 364-900.000.
Taylor, Charles L., 4,111,536, Cl. 352-132.000.

Singer, Malcolm Scott, to Chevron Research Company. N-alkyl or alkoxy-N'-substituted hydrocarbyl urea. 4,111,683, Cl. 71-104.000.

Sirlin, Jerome. Composite image design method. 4,111,696, Cl. 96-42.000.

Sivonen, Matti: *See—*
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Sjolie, Robert H. Modular base for waterbed or the like. 4,110,854, Cl. 5-2.00R.

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SKF Industrial Trading & Development Co., B.V.: *See—*
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Skidmore, William J., III, to Del Mar Avionics. Pulse echo ultrasonic system. 4,111,055, Cl. 73-620.000.

Skinner, Robert Thomas John, to Lucas Industries Limited. Fuel pumping apparatus. 4,111,173, Cl. 123-139.0AQ.

Sklarz, William A.: *See—*
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Sklodowsky, Paul George. Motorcycle passenger support. 4,111,448, Cl. 280-289.00E.

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Sloan Valve Company: *See—*
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Slocomb, Leon F., Jr. Window frame manufacture. 4,110,942, Cl. 52-100.000.

Small, Edward A., Jr.; and Lewin, Ian, to Optical Coating Laboratory, Inc. Lighting fixture and method using multiple reflections. 4,112,483, Cl. 362-298.000.

Smart, Charles L.: *See—*
Thomas, Norman W.; Model, Frank S.; and Smart, Charles L., 4,111,684, Cl. 71-115.000.

Smirnov, Anatoly Ilich: *See—*
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Smirnov, Boris Andreevich: *See—*
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Smith, Albert J.: *See—*
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Smith, Chester L.; and Everswick, David N., to United States of America, Army. Apparatus for determining the transmissivity of an optical medium. 4,111,559, Cl. 356-201.000.

Smith, Christopher Joseph: *See—*
Smith, Noel Edward; and Smith, Christopher Joseph, 4,111,781, Cl. 204-280.000.

Smith, Curtis P.; and Ulrich, Henri, to Upjohn Company, The. O,O'-Bis(hydroxyalkyl) N,N-di(lower-alkyl)aminomethane phosphonates. 4,112,014, Cl. 260-945.000.

Smith, Gary R., to Kusel Equipment Company. Portable cheese press frame assembly. 4,111,110, Cl. 99-456.000.

Smith International, Inc.: *See—*
Duncan, Grant, 4,111,262, Cl. 166-99.000.

Smith, James C.: *See—*
Alstrin, Charles E.; McClung, Carl L.; and Smith, James C., 4,111,166, Cl. 123-97.00B.

Smith, James D.B., to Westinghouse Electric Corp. Flexible resin rich epoxide-mica winding tape insulation containing organo-tin catalysts. 4,112,183, Cl. 428-363.000.

Smith, Joseph E. Safety device for preventing unauthorized actuation of a touch-actuated mechanism. 4,110,928, Cl. 42-66.000.

Smith Kline & French Laboratories Limited: *See—*
Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, 4,111,935, Cl. 544-224.000.
Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, 4,111,936, Cl. 544-239.000.
Durant, Graham John; and Ganellin, Charon Robin, 4,112,104, Cl. 424-270.000.

Smith, Loring E.; and Aloisi, Mario J. Tamper-proof emergency exit window grate. 4,111,472, Cl. 292-92.000.

Smith, Michael J.: *See—*
Przybyla, Franciszek J.; and Smith, Michael J., 4,112,198, Cl. 429-27.000.

Smith, Noel Edward; and Smith, Christopher Joseph. Dangler assembly for electro-chemical apparatus. 4,111,781, Cl. 204-280.000.

Smith, Thomas Basil, III, to Charles Stark Draper Laboratory, Inc., The. Fault-tolerant network with node branching. 4,112,488, Cl. 364-200.000.

Smith, Willis A., to Wasylchak, Russell W., a part interest. Universal jig for table rotary cutting tools. 4,111,409, Cl. 269-304.000.

Smithers, Michael James, to Imperial Chemical Industries Limited. Methods and compositions for use in animal husbandry. 4,112,120, Cl. 424-323.000.

SmithKline Corporation: *See—*
Berges, David A., 4,112,086, Cl. 424-246.000.
Berges, David A., 4,112,088, Cl. 424-246.000.
Gleason, John Gerald, 4,111,981, Cl. 562-444.000.
Hill, David T., 4,112,113, Cl. 424-275.000.
Holden, Kenneth George; and Yim, Nelson Chi-Fai, 4,111,957, Cl. 260-332.20C.

Snamprogetti, S.p.A.: *See—*
Degen, Ludwig; Viglia, Aurelio; Fascetti, Eugenio; and Perricone, Elena, 4,111,749, Cl. 195-2.000.
Rescalli, Carlo; and Pacifico, Antonio, 4,112,009, Cl. 260-677.00A.

Sniderman, Albert, to Burroughs Corporation. Pressure-sensitive writing stylus. 4,111,052, Cl. 73-432.00R.

Snoke, Roy Eugene: *See—*
Schaeffer, James Robert; Snoke, Roy Eugene; and Harris, Harry Wayne, 4,111,838, Cl. 252-430.000.

Sobin, Bernard: *See—*
Boomus, Mary; Sobin, Bernard; and Vincent, Monty E., 4,111,807, Cl. 210-152.000.

Socha, Paul: *See—*
Limbach, Paul; and Socha, Paul, 4,111,634, Cl. 425-505.000.

Societa' Farmaceutici Italia S.p.A.: *See—*
Arcamone, Federico; Bargiotti, Alberto; di Marco, Aurelio; and Penco, Sergio, 4,112,076, Cl. 424-180.000.

Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Burgert, Albert, 4,112,383, Cl. 329-50.000.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Badertscher, Ernest; and Easton, George Anthony, 4,112,132, Cl. 426-603.000.

Societe Degremont: *See—*
Louboutin, Robert, 4,111,802, Cl. 210-46.000.

Societe Europeenne des Produits Refractaires: *See—*
Kiehl, Jean-Pierre; Jost, Victor; and Clavaud, Bernard Alain, 4,111,711, Cl. 106-97.000.

Societe Generale de Constructions Electriques et Mecaniques Alsthom: *See—*
Pichon, Jacques, 4,111,809, Cl. 210-242.00R.

Societe Lorraine de Laminage Continu: *See—*
Rault, Daniel Raymond, 4,111,032, Cl. 72-366.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Bimond, Jean-Pierre; and Lazarre, Flavien, 4,111,829, Cl. 252-361.000.
Gratacos, Jaime; Perrolet, Christian; and Mousteou, Roger, 4,111,040, Cl. 73-105.000.

Solar Energy Research Corp.: *See—*
Wiegand, James B., 4,111,187, Cl. 126-271.000.

Soma, Takashi: *See—*
Goto, Eiichi; Soma, Takashi; and Idesawa, Masanori, 4,112,305, Cl. 250-492.00R.

Sonneville, Roger Paul, to Suprotec S.A. Device for insulating and fastening railway rails. 4,111,361, Cl. 238-338.000.

Sorrells, Samuel Ray, to Burlington Industries, Inc. Tufted pile fabric and method of making and installing the same. 4,112,161, Cl. 428-95.000.

Sowa, Tsuneo: *See—*
Tsunoda, Kozo; Sowa, Tsuneo; Iitsuka, Kunio; and Sako, Kiyohide, 4,112,221, Cl. 536-24.000.

Sowman, Harold G.: *See—*
Lange, Roger W.; and Sowman, Harold G., 4,112,186, Cl. 428-411.000.

Spadini, Gianfranco Luigi; and Demessemaekers, Emiel Mathilde Anna Alfons, to Procter & Gamble Company, The. General purpose household cleaner. 4,111,854, Cl. 252-541.000.

Spanel, Abram N.; Eiland, P. Frank; and Jacobs, David R., to Spanel, Abram N. Yarn clamping apparatus. 4,111,136, Cl. 112-79.00R.

Sparks, Bryan D.: *See—*
Meadus, Frederick W.; Sparks, Bryan D.; and Puddington, Ira E., 4,111,874, Cl. 260-23.00R.

Sparks, John: *See—*
Feingold, Michael; and Sparks, John, 4,112,054, Cl. 423-245.000.

Spaziante, Placido Maria: *See—*
De Nora, Vittorio; Nidola, Antonio; and Spaziante, Placido Maria, 4,111,765, Cl. 204-67.000.

Special Metals Corporation: *See—*
Baranow, Sanford, 4,111,685, Cl. 75-951.000.

Spector, George: *See—*
Sbarra, Frank; and Spector, George, 4,111,200, Cl. 128-233.000.

Spectron Corporation: *See—*
Palmer, James E.; Lavallee, Donald C.; and Huber, George, 4,112,401, Cl. 335-206.000.

Spellman, Gordon B.: *See—*
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,112,458, Cl. 357-38.000.
Sperber, Henry. Feeding apparatus for a pneumatic conveying system. 4,111,493, Cl. 302-42.000.
Sperry, Charles Richard, to Sealed Air Corporation. Bladder actuated pumping system. 4,111,613, Cl. 417-394.000.
Sperry Rand Corporation: *See—*
Lins, Stanley James, 4,112,503, Cl. 365-29.000.
Marchetti, Michael John, 4,112,271, Cl. 200-52.00R.
Scheuneman, James Herman, 4,112,502, Cl. 364-900.000.
Thatcher, Steve Douglas, 4,112,380, Cl. 328-62.000.
Spevack, Jerome S., to Deuterium Corporation. Improvements in evaporation condensation systems. 4,112,062, Cl. 423-580.00H.
Spinnstoffabrik Zehlendorf Aktiengesellschaft: *See—*
Dolle, Meinolf, 4,111,375, Cl. 242-18.0PW.
Spitko, Richard J.: *See—*
Roman, Stephan; and Spitko, Richard J., 4,111,605, Cl. 416-141.000.
Spoelder, Gerrit Adriaan, to U.S. Philips Corporation. Memory with dynamic information storage. 4,112,514, Cl. 365-222.000.
Sprengling, Gerhard R.; and Edelman, Leonard E., to Westinghouse Electric Corp. Apparatus and method for chemically removing plastics. 4,111,715, Cl. 134-10.000.
Square D Company: *See—*
Leive, Ernest W., 4,112,248, Cl. 174-50.000.
SRI International: *See—*
Henry, David W.; and Tong, George L., 4,112,217, Cl. 536-4.000.
Stager, Francis W., to Litton Industrial Products, Inc. Conical compression spring. 4,111,407, Cl. 267-166.000.
Stahl, William F., to Westinghouse Electric Corp. Ceramic rotor blade assembly for a gas turbine engine. 4,111,603, Cl. 416-95.000.
Stahle, Martin. Centrifugal pump for viscous media. 4,111,599, Cl. 415-215.000.
Stamicarbon, B.V.: *See—*
Boesten, Wilhelmus H. J., 4,111,980, Cl. 562-401.000.
Bour, Edmond H. J. P., 4,111,904, Cl. 260-45.75N.
de Cooker, Mario G. R. T., 4,112,232, Cl. 544-192.000.
van Montfoort, Abraham; and Scholten, Joseph J. F., 4,111,842, Cl. 252-447.000.
Stampfli, Harald, to Lucifer S.A. Servo-controlled valve. 4,111,230, Cl. 137-625.500.
Standard Brands Incorporated: *See—*
Colilla, William; and Lloyd, Norman E., 4,111,750, Cl. 195-31.00F.
Standard Car Truck Company: *See—*
Bullock, Robert L., 4,111,131, Cl. 105-224.100.
Standard Oil Company (Indiana): *See—*
Karayannis, Nicholas M.; and Grams, Harold, 4,111,836, Cl. 252-429.00B.
Zimmerschied, Wilford J., 4,111,986, Cl. 562-549.000.
Stanek, Jaroslav: *See—*
Baschang, Gerhard; Sele, Alex; Stanek, Jaroslav; and Rossi, Alberto, 4,112,075, Cl. 424-180.000.
Stark, Bernard Peter: *See—*
Green, George Edward; Stark, Bernard Peter; and Waterhouse, John Sidney, 4,111,907, Cl. 260-830.00R.
State of Israel, Prime Minister's Office, The Israel Institute for Biological Research, The: *See—*
Ashani, Yacov; Amitai, Gavriel; Grunfeld, Yona; Kalir, Asher; and Cohen, Sasson, 4,112,082, Cl. 424-209.000.
State of Rhode Island, The Board of Regents for Education of the: *See—*
Frechette, Michael W.; and Fasching, James L., 4,111,036, Cl. 73-23.000.
Stauffer Chemical Company: *See—*
Deatcher, John H., 4,111,882, Cl. 260-30.60R.
Gutman, Arnold David, 4,111,682, Cl. 71-98.000.
Lin, Chii-Fa; and Blanch, Julian E., 4,112,223, Cl. 536-114.000.
Pallos, Ferenc, 4,112,116, Cl. 424-301.000.
Steag A.G.: *See—*
Pasternak, Rudolf; and Bauer, Jochen, 4,111,665, Cl. 48-77.000.
Steber, Norman J.: *See—*
Mechling, Charles H.; Niedermier, James B.; and Steber, Norman J., 4,111,676, Cl. 65-114.000.
Stefanski, Anthony T.: *See—*
Carson, John Robert; Carmosin, Richard J.; and Stefanski, Anthony T., 4,111,954, Cl. 260-326.620.
Steger, Thomas: *See—*
Field, Roger; and Steger, Thomas, 4,111,093, Cl. 84-267.000.
Steigelman, James Q., to GTE Sylvania Incorporated. Refractory metal carbide articles and laminating method for producing same. 4,112,180, Cl. 428-332.000.
Steinberg, Friedhelm; and Voss, Gunter, to Metallgesellschaft Aktiengesellschaft. Printing paste. 4,111,704, Cl. 106-25.000.
Steinbichler, Hans: *See—*
Rottenkolber, Hans; and Steinbichler, Hans, 4,111,557, Cl. 356-168.000.
Steinbrecher Corporation: *See—*
Steinbrecher, Donald H., 4,112,374, Cl. 325-446.000.
Steinbrecher, Donald H., to Steinbrecher Corporation. Doubly balanced mixer with optimized dynamic range. 4,112,374, Cl. 325-446.000.
Steinebrunner, Walter; Zahoransky, Arthur; and Zahoransky, Heinz, to Zahoransky, Anton. Method and apparatus for feeding bristles in brush making machines. 4,111,491, Cl. 300-21.000.
Steiner, Edward L., to Xerox Corporation. Apparatus and method for noise immunity in distributing control signals in electrostatographic processing machines. 4,111,543, Cl. 355-14.000.
Steiner, Edward L., to Xerox Corporation. Apparatus and method for noise immunity for control signals in electrostatographic processing machines. 4,111,544, Cl. 355-14.000.
Steininger, Alfred: *See—*
Kuhls, Jurgen; Steininger, Alfred; and Fitz, Herbert, 4,112,211, Cl. 526-219.000.
Steinkopf, Wolfgang Otto Gotthard; and Drabek, Rudolf, to U.S. Philips Corporation. Television player with an identification signal adding device. 4,112,445, Cl. 358-127.000.
Stemmle, Denis J., to Xerox Corporation. Duplex document copying. 4,111,547, Cl. 355-24.000.
Stendel, Wilhelm: *See—*
Enders, Edgar; Stendel, Wilhelm; and Voege, Herbert, 4,112,065, Cl. 424-45.000.
Stenudd, Sven Gunnar Valter, to Facit Aktiebolag. Method for making dust cover for printing needles. 4,110,884, Cl. 29-163.50R.
Stepan Chemical Company: *See—*
Shultz, Andrew; and Stepan, F. Quinn, 4,111,853, Cl. 252-536.000.
Stepan, F. Quinn: *See—*
Shultz, Andrew; and Stepan, F. Quinn, 4,111,853, Cl. 252-536.000.
Sterling Drug Inc.: *See—*
Ackerman, James H., 4,111,937, Cl. 260-281.0GN.
Carlson, John Alan; and Bell, Malcolm Rice, 4,112,105, Cl. 424-270.000.
Crounse, Nathan N.; and Desai, Kantilal B., 4,111,962, Cl. 260-346.710.
Gelotte, Karl O.; Zalay, Andrew W.; and Bell, Malcolm R., 4,111,946, Cl. 260-297.00R.
Sternbach, Leo Henryk: *See—*
Fryer, Rodney Ian; Sternbach, Leo Henryk; and Walser, Armin, 4,111,934, Cl. 260-239.30B.
Sterrett, Dale E., to Tenneco Inc. Louver flow muffler. 4,111,279, Cl. 181-264.000.
Stetson, Robert F.: *See—*
Pieren, William R.; and Stetson, Robert F., 4,112,288, Cl. 219-121.00P.
Stevens, Albert F. Extraction of contents from envelopes. 4,110,958, Cl. 53-386.000.
Stevens, Robert R., to Sanders Associates, Inc. Capacitor matrix correlator for use in the correlation of periodic signals. 4,112,496, Cl. 364-728.000.
Stevenson, James Santon, to Terminator Products, Inc. Method and apparatus for preparing empty chemical containers for disposal. 4,111,716, Cl. 134-10.000.
Stevenson, Peter Alan: *See—*
Hauke, Francis Edward; McCully, Everette Ray; McElroy, Robert Marion, Jr.; Stevenson, Peter Alan; Vogel, Stephen Martin; and Woods, John Walton, 4,112,472, Cl. 360-102.000.
Stewart, Norman C.: *See—*
Wolk, Ronald H.; and Stewart, Norman C., 4,111,663, Cl. 422-191.000.
Stichting Energieonderzoek Centrum Nederland: *See—*
Theyse, Frederik H., 4,112,311, Cl. 290-44.000.
Stiefel, Kenneth Erwin, to Bell Telephone Laboratories, Incorporated. Telephone station repeater. 4,112,262, Cl. 179-170.00G.
Stiles, Alvin B., to Du Pont de Nemours, E. I., and Company. Methanol synthesis catalyst. 4,111,847, Cl. 252-463.000.
Stimson, Grant L.; and Kesten, Patrick N., to General Motors Corporation. Metallized glass seal resistor compositions and resistor spark plugs. 4,112,330, Cl. 315-46.000.
Stitt, Robert M.: *See—*
Olschewski, Wilfred W.; and Stitt, Robert M., 4,112,308, Cl. 250-551.000.
Stitt, Thomas Detlor; and Williamson, Dennis Francis, to General Electric Company. D-C motor flashover protection. 4,112,475, Cl. 361-33.000.
Stiven, David: *See—*
Pollard, Christopher A.; and Stiven, David, 4,112,471, Cl. 360-98.000.
Stobb, Walter John. Signature bundle hoist clamp with pivot. 4,111,310, Cl. 214-1.0QD.
Stockel, Joseph: *See—*
Dunlop, James D.; and Stockel, Joseph, 4,112,199, Cl. 429-29.000.
Stoehr, Robert A.; Ormesher, Robert J.; and Jacobs, Stanley C., to Aluminum Company of America. Method for feeding a subliming material into a liquid. 4,111,764, Cl. 204-64.00R.
Stone Container Corporation: *See—*
Partain, James H., 4,111,300, Cl. 206-280.000.
Strand, Neal T.; and Esboldt, Richard J., to Minnesota Mining and Manufacturing Company. Automatic scroll sign. 4,110,925, Cl. 40-466.000.
Strandberg, Hasse Eivind: *See—*
Johnston, Gordon Boyd; and Strandberg, Hasse Eivind, 4,111,501, Cl. 308-201.000.
Stratienko, Andrew, to Dresser Industries, Inc. Valve actuator and spring biasing cartridge. 4,111,070, Cl. 74-625.000.
Streifer, William; Scifres, Donald R.; and Burnham, Robert D., to Xerox Corporation. Semiconductor light reflector/light transmitter. 4,111,521, Cl. 350-96.130.
Streifer, William; Scifres, Donald R.; and Burnham, Robert D., to Xerox Corporation. Diode laser with ring reflector. 4,112,389, Cl. 331-94.50H.
Strijker, Hendrik Willem, to U.S. Philips Corporation. Shaving apparatus with band cutter. 4,110,905, Cl. 30-43.600.

Strop, Petr; Coupek, Jiri; and Mikes, Otakar, to Ceskoslovenska akademie ved. Method of preparation of ion exchangers by alkylation and hydroxyalkylation of polymeric hydrophilic anion exchangers. 4,111,859, Cl. 521-33.000.

Strubelt, Charles E.: *See—*
Sullivan, Daniel S., 3rd; Strubelt, Charles E.; and Becker, Kenneth W., 4,112,001, Cl. 568-855.000.

Stubbings, James Henry, to Potomac Applied Mechanics, Inc. Assembly of straight duct and transitions. 4,111,143, Cl. 113-1.00N.

Stueben, Kenneth Charles, to Union Carbide Corporation. Radiation curable pressure sensitive adhesive composition. 4,111,769, Cl. 204-159.150.

Stunkard, Norman W.: *See—*
Carpenter, C. Thomas; and Stunkard, Norman W., 4,111,294, Cl. 198-381.000.

Suarez, Rafael: *See—*
Bahder, George; Eager, George S., Jr.; and Suarez, Rafael, 4,112,354, Cl. 324-54.000.

Sucheck, Robert J. Shingle gage. 4,110,911, Cl. 33-188.000.

Sudakas, Lev Girshovich: *See—*
Junovich, July Moiseevich; Zhukovsky, Sergei Semenovich; Sudakas, Lev Girshovich; Turkina, Ljudmila Ivanovna; Smirnov, Anatoly Ilich; Lyass, Abram Moiseevich; and Teplyakov, Sergei Dmitrievich, 4,111,705, Cl. 106-38.350.

Suessenbeck, Heinrich: *See—*
Sigott, Siegfried; Suessenbeck, Heinrich; Zitz, Alfred; and Siebenhofer, Gottfried, 4,111,227, Cl. 137-469.000.

Sugatsune Industrial Co., Ltd.: *See—*
Ishii, Hiroyuki, 4,110,866, Cl. 16-35.00R.

Sugi, Nagatoshi: *See—*
Komuro, Keiji; Ohishi, Tetsu; Waku, Tetsuo; Sugi, Nagatoshi; Suzuki, Souichi; and Ueda, Akio, 4,111,867, Cl. 260-5.000.

Sugimura, Hidehiko; Murakami, Hisashi; Ohtsubo, Toshikatsu; and Fukuda, Kenji, to Mitsui Coke Co., Ltd. Process for liquefying coal. 4,111,786, Cl. 208-8.000.

Sugita, Jitsuo: *See—*
Yukinaga, Hisajiro; Sumimoto, Shinzaburo; Ishizuka, Ichiro; and Sugita, Jitsuo, 4,111,680, Cl. 71-88.000.

Sugiura, Susumu: *See—*
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,111,539, Cl. 355-3.00R.

Sugiyama, Toul: *See—*
Yoshida, Eiichi; Nakao, Hideo; Goto, Norimasa; Sugiyama, Toul; and Kashiwaya, Sadao, 4,112,141, Cl. 427-142.000.

Sullivan, Daniel S., 3rd; Strubelt, Charles E.; and Becker, Kenneth W., to Exxon Research & Engineering Co. Diacetylenic alcohol corrosion inhibitors. 4,112,001, Cl. 568-855.000.

Sullivan, Neal; and Cook, George E., to KFC Corporation. Control system for energizing electrical resistance heaters in cooking fluids. 4,111,443, Cl. 219-497.000.

Sulzer Brothers Ltd.: *See—*
Bula, Karl, 4,111,251, Cl. 152-219.000.

Sumimoto, Shinzaburo: *See—*
Yukinaga, Hisajiro; Sumimoto, Shinzaburo; Ishizuka, Ichiro; and Sugita, Jitsuo, 4,111,680, Cl. 71-88.000.

Sumitomo Chemical Company, Limited: *See—*
Kotera, Norio; Okabe, Hiromichi; and Korenaga, Hiroshi, 4,111,979, Cl. 260-509.000.

Sumitomo Durez Company, Ltd.: *See—*
Kako, Yuji; Kikuga, Toyoji; and Toko, Akira, 4,112,160, Cl. 428-460.000.

Sumitomo Electric Industries, Ltd.: *See—*
Otani, Kanji, 4,111,621, Cl. 425-97.000.

Sumitomo Naugatuck Co., Ltd.: *See—*
Shima, Takesaburo; Kozima, Hiroshi; Yoshida, Tomio; and Nakamura, Joji, 4,112,021, Cl. 260-880.00R.

Summers, Gary J. Fuel economy measuring circuit employing rate multiplier components. 4,112,492, Cl. 364-442.000.

Summers, Kenneth L., to Riehe Corporation. Tamper-proof closure device. 4,111,331, Cl. 220-319.000.

Sun Chemical Corporation: *See—*
DeBlasi, Douglas S., 4,111,916, Cl. 528-75.000.

Sundstrand Corporation: *See—*
Bolinger, Jimmy W.; Pollman, Frederic W.; and Polaski, David N., 4,111,003, Cl. 60-469.000.
Paczuski, Andrew Waclaw, 4,111,612, Cl. 417-372.000.

Super Stud Products, Inc.: *See—*
Dawson, Raymond B., 4,111,016, Cl. 70-58.000.

Suprotec S.A.: *See—*
Sonneville, Roger Paul, 4,111,361, Cl. 238-338.000.

Sutch, Brian Leo Chudleigh, to Airfix Industries Limited. Production of containers. 4,111,622, Cl. 425-112.000.

Sutter, Aldo. Impact resistant explosion proof lamp comprising encapsulated light source. 4,112,485, Cl. 362-369.000.

Suzaki, Satoru: *See—*
Kameyama, Yasuyoshi; and Suzaki, Satoru, 4,112,407, Cl. 337-398.000.

Suzuki, Akira: *See—*
Kobayashi, Kazuo; Suzuki, Akira; Tanaka, Motoharu; Inaba, Norihiko; and Yuyama, Hisao, 4,111,823, Cl. 252-62.10P.

Suzuki, Hirotsugu: *See—*
Kikuchi, Yoshikazu; Suzuki, Hirotsugu; and Yabe, Kenji, 4,112,175, Cl. 428-236.000.

Suzuki, Noboru: *See—*
Ichinose, Isao; Sakemoto, Mitsuhiro; and Suzuki, Noboru, 4,111,323, Cl. 215-230.000.

Suzuki, Shirou: *See—*
Murayama, Naohiro; Fukuda, Makoto; Sakagami, Teruo; Suzuki, Shirou; Kokubu, Yoshikazu; and Enoki, Toshio, 4,111,780, Cl. 204-266.000.

Suzuki, Souichi: *See—*
Komuro, Keiji; Ohishi, Tetsu; Waku, Tetsuo; Sugi, Nagatoshi; Suzuki, Souichi; and Ueda, Akio, 4,111,867, Cl. 260-5.000.

Suzuki, Yoshiro: *See—*
Nishikawa, Masaji; Suzuki, Yoshiro; and Yasuda, Tadahiro, 4,111,156, Cl. 118-662.000.

Svaty, Vladimir, to Elitex, Koncern textilniho strojirenstvi. Apparatus for releasably securing a fluid-operated gripper shuttle in a launch position. 4,111,239, Cl. 139-438.000.

Svenska Utvecklingaktiebolatget: *See—*
Casselbrant, Sven Gustav, 4,112,162, Cl. 428-106.000.

Swackhamer, Stanley B., to Xerox Corporation. Magnetic toner recovery method using alternating magnetic field polarities. 4,112,156, Cl. 427-444.000.

Swaine, James William, Jr.: *See—*
Hoffmann, Robert Joel; Bean, Samuel Louis; Seeling, Philip; and Swaine, James William, Jr., 4,112,061, Cl. 423-512.00A.

Swank, Harry R.: *See—*
Bracht, Donald L.; and Swank, Harry R., 4,110,877, Cl. 29-25.130.

Swann, Frederick R. Solar heating system. 4,111,185, Cl. 126-271.000.

Swietoslawski, Janusz; Silowiecki, Andrzej; Ratajczak, Aleksander; Nocon, Barbara; and Baniak, Zofia, to Zaklady Chemiczne "Organika-Azot". Process for production of 4,4-isopropylidene-bis-2,6-dibromo/phenol. 4,112,242, Cl. 568-726.000.

Swiss Aluminium Ltd.: *See—*
Pryor, Michael J., 4,111,763, Cl. 204-38.00A.

SWS Silicones Corporation: *See—*
Getson, John C.; and Johnson, Wendell L., 4,111,890, Cl. 260-37.0SB.

Syntex (U.S.A.) Inc.: *See—*
Beeby, Philip J., 4,112,087, Cl. 424-246.000.
Nelson, Peter H.; and Untch, Karl G., 4,112,114, Cl. 424-285.000.

Syska, Andrew J., to Consolidated Natural Gas Service Company, Inc. Process for the production of intermediate hot metal. 4,111,687, Cl. 75-13.000.

Systems, Science and Software: *See—*
Flanagan. Brian S.; Turner, Phillip L.; Broce, Richard D.; and Lagus, Peter L., 4,112,302, Cl. 250-381.000.

Systems and Technics S.A.: *See—*
Brisebarre, Marcel, 4,111,216, Cl. 133-3.00A.

Szabo, Emery: *See—*
Hoch, Samuel; and Szabo, Emery, 4,111,903, Cl. 260-45.75S.

Tacchi, Victorio. Systems for making use of the energy carried by a fluid and supplied thereto by solar energy. 4,110,986, Cl. 60-641.000.

Taffelli, Aldo C.: *See—*
Grossi, Carlo; and Taffelli, Aldo C., 4,111,597, Cl. 415-143.000.

Takahasi, Toru; Ueno, Sadayasu; and Inui, Tomoji, to Hitachi, Ltd. High-temperature detecting apparatus. 4,112,478, Cl. 361-162.000.

Takano, Shuntaro: *See—*
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,112,090, Cl. 424-251.000.

Takano, Toshiaki: *See—*
Kumaki, Yoshihiro; Kawade, Junpei; Takano, Toshiaki; and Inoue, Mitsuo, 4,111,486, Cl. 299-1.000.

Takase, Katsuji; Tsuji, Toshimoto; Fukuda, Jun-ichi; and Hiyamori, Yasuchika, to Dai Nippon Toryo Co., Ltd. Anticorrosion primer coating composition. 4,111,884, Cl. 260-30.60R.

Takashi, Kurioka. Water supply suspending implement with stopping piece. 4,111,233, Cl. 138-89.000.

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Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,112,090, Cl. 424-251.000.

Takeda Chemical Company, Ltd.: *See—*
Noguchi, Shunsaku; Aono, Tetsuya; Araki, Yoshiaki; and Kawai, Kiyohisa, 4,111,997, Cl. 260-591.000.

Takeda Chemical Industries, Ltd.: *See—*
Fujino, Masahiko; Nishimura, Osamu; and Kitada, Chieko, 4,111,924, Cl. 260-112.50R.
Funakoshi, Yoshiro; Asogawa, Tatsuo; Satake, Eiichi; Motoyama, Shimesu; Yamada, Shuri; and Kakukawa, Morio, 4,111,626, Cl. 425-203.000.
Ono, Hiroomi, 4,112,073, Cl. 424-177.000.

Takeda Riken Kogyo Kabushikikaisha: *See—*
Ashida, Hitoshi, 4,112,358, Cl. 324-78.00D.

Takei, Daisuke: *See—*
Kurokawa, Takashi; Fujiwara, Michio; Akutsu, Yoshio; Otani, Akoi; Nagasawa, Harumi; Matsuo, Masujiro; Ishii, Yasuo; Ogawa, Sigeru; Itoh, Schun'ichi; and Takei, Daisuke, 4,112,260, Cl. 179-18.0FC.

Takekawa, Nobuhiro: *See—*
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,111,539, Cl. 355-3.00R.

Takizawa, Tatsuo; and Ikeda, Masachika, to Olympus Optical Co., Ltd.

Record sheet clamping mechanism for drum type facsimile and the like. 4,111,119, Cl. 101-127.100.
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Nakada, Takashi; and Takoh, Toshiharu, 4,112,361, Cl. 324-92.000.
Talenti, Pier F. Method and apparatus for operating combustion engines. 4,111,160, Cl. 123-1.00A.
Tamm, Rolf, to Bodenseewerk Perkin-Elmer & Co., GmbH. Graphite tube assembly having a sample supporting inner body. 4,111,563, Cl. 356-244.000.
Tamm, Rolf Gunther Arnold; and Huber, Bernhard Werner, to Bodenseewerk Perkin-Elmer & Co., GmbH. Sampling procedure and device for flameless atomic absorption spectroscopy. 4,111,051, Cl. 73-423.00A.
Tamura, Masaoki: *See—*
Ishikawa, Toshio; Ozawa, Jun; and Tamura, Masaoki, 4,112,418, Cl. 340-659.000.
Tamura, Teizou; and Konishi, Katsuo, to Hitachi, Ltd. Method for manufacturing a magnetic head for video signal. 4,110,902, Cl. 29-603.000.
Tanaka, Akira: *See—*
Yamaoka, Kojiro; Mihara, Toshihide; and Tanaka, Akira, 4,110,898, Cl. 29-568.000.
Tanaka, Katsuyuki: *See—*
Amemori, Hiroyuki; Izumi, Hideki; and Tanaka, Katsuyuki, 4,111,046, Cl. 73-231.00R.
Tanaka, Motoharu: *See—*
Kobayashi, Kazuo; Suzuki, Akira; Tanaka, Motoharu; Inaba, Norihiko; and Yuyama, Hisao, 4,111,823, Cl. 252-62.10P.
Tanaka, Shinichi: *See—*
Etoh, Kuniomi; Tanaka, Shinichi; Kato, Yoshio; and Kazuo, Watanabe, 4,111,692, Cl. 96-1.00R.
Tani, Kenroku: *See—*
Mifune, Hideo; Tani, Kenroku; and Noguchi, Toyota, 4,112,420, Cl. 340-550.000.
Tanimoto, Akikazu: *See—*
Nakazawa, Kiwao; and Tanimoto, Akikazu, 4,112,309, Cl. 250-560.000.
Tanimura, Masamitsu: *See—*
Asakura, Toshiyuki; Itoga, Masaaki; Hayakawa, Takeshi; and Tanimura, Masamitsu, 4,112,187, Cl. 428-474.000.
Tanimura, Takenori: *See—*
Kabasawa, Yozo; and Tanimura, Takenori, 4,111,660, Cl. 423-8.000.
Taninaka, Kuniaki; Kurono, Hitoshi; and Kasai, Tsutomu, to Nihon Nohyaku Co., Ltd. 4-Substituted-1,3-dithiolan-2-ylidene malonates and pharmaceutical compositions containing the same. 4,112,089, Cl. 424-248.550.
Tanner Electronic Systems Technology: *See—*
Tanner, James L.; and Rist, Bruno A., 4,112,377, Cl. 325-461.000.
Tanner, James L.; and Rist, Bruno A., to Tanner Electronic Systems Technology. C. B. converter. 4,112,377, Cl. 325-461.000.
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Oya, Hiroo; and Tatejima, Masakazu, 4,110,976, Cl. 60-282.000.
Tates, Donald W.; and Clarkson, Stanley G., to Xerox Corporation. Sorting apparatus and reproducing machine. 4,111,410, Cl. 271-173.000.
Taub, David. Deformable container. 4,111,299, Cl. 206-215.000.
Tavor, Chanany, to Amiad Systems Ltd. Linear hydraulic motor. 4,111,607, Cl. 417-46.000.
Taylor, Challen E., to Goodyear Tire & Rubber Company, The. Apparatus for vulcanizing continuous lengths of flexible material. 4,111,628, Cl. 425-445.000.
Taylor, Charles L., to Singer Company, The. Automatic registration of projector images. 4,111,536, Cl. 352-132.000.
Taylor, Edwin Michael: *See—*
Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, 4,111,935, Cl. 544-224.000.
Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, 4,111,936, Cl. 544-239.000.
Taylor, Otis Max: *See—*
Hallberg, John Emil; and Taylor, Otis Max, 4,111,219, Cl. 137-3.000.
Taylor, Paul D., to Celanese Corporation. Homologation of alkanols. 4,111,837, Cl. 252-430.000.
Taylor, Richard F.: *See—*
Glossop, Mark B.; Buckmaster, Adrian C.; Cook, Neville G. W.; Hojem, Justin P. M.; Joughin, Noel C.; Taylor, Richard F.; Cramp, Robert W.; and Hatcher, John L., 4,111,296, Cl. 198-519.000.
TDK Electronic Company: *See—*
Umeki, Shinji; Uebori, Tatsuo; and Motegi, Minoru, 4,112,184, Cl. 428-403.000.
Tedei, Thomas C. Flush valve assembly. 4,110,850, Cl. 4-326.000.
Tekken Construction Co. Ltd.: *See—*
Kumaki, Yoshihiro; Kawade, Junpei; Takano, Toshiaki; and Inoue, Mitsuo, 4,111,486, Cl. 299-1.000.
Tekken Kensetu Co. Ltd.: *See—*
Jyo, Shigeru, 4,110,992, Cl. 405-147.000.
Teledyne Industries, Inc.: *See—*
Regueiro, Jose F., 4,111,177, Cl. 123-32.0ST.
Shepard, Lynn R.; and Terrell, John B., 4,111,030, Cl. 72-351.000.
Teledyne Penn-Union: *See—*
Williams, Charles F., 4,112,043, Cl. 264-250.000.
Telic Corporation: *See—*
Penfold, Alan S.; and Thornton, John A., 4,111,782, Cl. 204-298.000.
Tenneco Chemicals, Inc.: *See—*
Hoch, Samuel; and Szabo, Emery, 4,111,903, Cl. 260-45.75S.
Lazarus, Allan K.; and Knapp, Malcolm H., 4,111,821, Cl. 252-49.900.
Tenneco Inc.: *See—*
Sterrett, Dale E., 4,111,279, Cl. 181-264.000.
Tenta, Louis T. Method and composition for the treatment of seborrheic keratosis. 4,112,121, Cl. 424-346.000.
Teplyakov, Sergei Dmitrievich: *See—*
Junovich, July Moiseevich; Zhukovsky, Sergei Semenovich; Sudakas, Lev Girshovich; Turkina, Ljudmila Ivanovna; Smirnov, Anatoly Ilich; Lyass, Abram Moiseevich; and Teplyakov, Sergei Dmitrievich, 4,111,705, Cl. 106-38.350.
Teradyne, Inc.: *See—*
Katz, Jonathon H., 4,112,364, Cl. 324-158.00F.
Terminator Products, Inc.: *See—*
Stevenson, James Santon, 4,111,716, Cl. 134-10.000.
Terrell, John B.: *See—*
Shepard, Lynn R.; and Terrell, John B., 4,111,030, Cl. 72-351.000.
Terwilliger, Bruce J., to GAF Corporation. Process for multi-color valley printing and embossing of flooring material and the like and flooring material made by said process. 4,112,189, Cl. 428-443.000.
Tesoro, Giuliana C., to Ethyl Corporation. Synergistic flame retardant mixtures and products. 4,111,652, Cl. 8-116.00P.
Tessier, Jean: *See—*
Martel, Jacques; and Tessier, Jean, 4,111,994, Cl. 260-586.00R.
Tetro, Richard S.; and Harmon, Paul E., to Black Clawson Company, The. Method and apparatus for continuously winding a roll of web material. 4,111,377, Cl. 242-56.00R.
Tex Innovation AB: *See—*
Olsson, Jan Christer Holger; and Carlson, Karl Gunnar, 4,110,954, Cl. 53-433.000.
Texaco Inc.: *See—*
Howlett, Donald L., 4,112,412, Cl. 340-15.5TS.
Knifton, John F., 4,111,952, Cl. 260-326.5FN.
Vest, Eugene W., 4,111,244, Cl. 141-348.000.
Texaco Trinidad Inc.: *See—*
Downer, John D., 4,111,678, Cl. 71-27.000.
Texas Instruments Incorporated: *See—*
Allen, John B.; and Coale, Cecil R., Jr., 4,111,383, Cl. 244-3.130.
Allen, John B., 4,111,385, Cl. 244-3.130.
Cooper, Erwin E., 4,111,384, Cl. 244-3.130.
Easley, Steven J., 4,112,495, Cl. 364-700.000.
Holmes, Jerry D.; Johnson, Charles R.; Jones, Allen S.; and Hewes, Charles R., 4,112,372, Cl. 325-321.000.
Wall, Lawrence S., 4,112,509, Cl. 365-185.000.
Tezuka, Chikao; and Mikoshiba, Hitoshi. Selecting mechanism for printing type rings. 4,111,117, Cl. 101-93.280.
Th. Kieserling & Albrecht: *See—*
Goeke, Alfons, 4,111,589, Cl. 407-114.000.
Thallmair, Ernst: *See—*
Sellmann, Dieter; and Thallmair, Ernst, 4,111,971, Cl. 260-438.50R.
Thatcher, Steve Douglas, to Sperry Rand Corporation. Clock sequencing apparatus having more states than clock phase outputs. 4,112,380, Cl. 328-62.000.
Theeuwes, Felix, to Alza Corporation. Osmotic system for delivering selected beneficial agents having varying degrees of solubility. 4,111,201, Cl. 128-260.000.
Theeuwes, Felix, to Alza Corporation. Osmotic system for the controlled and delivery of agent over time. 4,111,202, Cl. 128-260.000.
Theeuwes, Felix, to Alza Corporation. Osmotic system with means for improving delivery kinetics of system. 4,111,203, Cl. 128-260.000.
Thexton Manufacturing Company: *See—*
Journey, John, 4,111,063, Cl. 74-242.600.
Theyse, Frederik H., to Stichting Energieonderzoek Centrum Nederland. Windmill plant for generating energy. 4,112,311, Cl. 290-44.000.
Thibault, Olida. Hydraulic wheel II. 4,111,618, Cl. 418-152.000.
Thiel, Reinhard: *See—*
Rohbock, Klaus; Wiemers, Rudolf; Woditsch, Peter; and Thiel, Reinhard, 4,111,832, Cl. 252-412.000.
Thielemann, Max: *See—*
Schuster, Friedrich; Thielemann, Max; and Lang, Otto, 4,110,962, Cl. 57-77.400.
Thiem, Karl-Werner; Hamers, Adolf; and Heinen, Josef, to Bayer Aktiengesellschaft. Process for the preparation of mononitroaromatic compounds. 4,112,005, Cl. 260-645.000.
Thomanek, Franz Rudolf, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Warhead for use against armored targets. 4,111,126, Cl. 102-52.000.
Thomas Barben Instruments: *See—*
Barben, Theodore R., II, 4,112,352, Cl. 324-30.00R.
Thomas, Claude E. Packaged dinner serving tray. 4,111,305, Cl. 206-563.000.
Thomas, Donald A.: *See—*
Maccalous, Joseph W.; and Thomas, Donald A., 4,112,179, Cl. 428-325.000.
Thomas GmbH: *See—*
Schmidt, Ingo, 4,111,339, Cl. 222-394.000.
Thomas, Hubert E. Variable eccentric vibration generating mechanism. 4,111,061, Cl. 74-61.000.
Thomas, Norman W.; Model, Frank S.; and Smart, Charles L., to Celanese Corporation. Herbicide-filled cellulose ester particles having controlled release properties. 4,111,684, Cl. 71-115.000.
Thomas, Walter Moreland: *See—*
Huffman, Kenneth Robert; Casey, Donald James; and Thomas, Walter Moreland, 4,112,169, Cl. 428-206.000.

Thompson, Edwin C., to Western Electric Company, Inc. Method of manufacturing a monolithic crystal filter. 4,112,147, Cl. 427-100.000.
Thompson, Isadore; and Fehr, Rudolph. Method and structure for rehabilitating sheet pile cellular coffer dams. 4,110,990, Cl. 405-14.000.
Thompson, John; and Pitfield, Adrian, to Wilkinson Sword Limited. Aerosol foams. 4,111,827, Cl. 252-90.000.
Thompson, Kenneth P.: *See—*
Roudebush, Allen T.; and Thompson, Kenneth P., 4,112,173, Cl. 428-215.000.
Thompson, M. Stafford. Resilient article and method of manufacture. 4,110,881, Cl. 29-91.100.
Thompson, Max W., to Phillips Petroleum Company. Method and apparatus for recovering vapor. 4,110,996, Cl. 62-54.000.
Thompson, Robert W., to Westinghouse Electric Corp. Method for testing dielectric adequacy and for indicating physical defects in a nonconducting material by depositing traces of carbon on the material. 4,112,353, Cl. 324-54.000.
Thompson, Wallace W.: *See—*
United States of America, National Aeronautics and Space Administration; and Thompson, Wallace W., 4,111,729, Cl. 149-19.900.
Thomson-CSF: *See—*
Cojan, Yves, 4,111,527, Cl. 350-174.000.
Dubois, Jean Claude; and Barre, Francoise, 4,112,239, Cl. 560-73.000.
Hepner, Georges; and Desormiere, Bernard, 4,112,367, Cl. 324-244.000.
Pressiat, Robert, 4,112,294, Cl. 250-203.00R.
Thomson, James E., to Western Stamping Corporation. Thread tensioner. 4,111,141, Cl. 112-254.000.
Thornton, John A.: *See—*
Penfold, Alan S.; and Thornton, John A., 4,111,782, Cl. 204-298.000.
Thornton, Raymond: *See—*
McConnell, Bobby Lee; Thornton, Raymond; and Graham, Louis Atkins, 4,111,648, Cl. 8-30.000.
Thorpe, John E., to Pfizer Inc. Halopyridyl derivatives of m-aminotetramisole as anthelmintics. 4,112,102, Cl. 424-266.000.
Thorsell, Leif Urban Folke: *See—*
Weibull, Bengt John Gustaf; and Thorsell, Leif Urban Folke, 4,112,231, Cl. 544-174.000.
Thurston, Bruce E.; Owens, Albert H.; and Pocsi, Powell J., to United States of America, Army. Cable-connector backshell adapter device. 4,111,513, Cl. 339-143.00R.
Thyssen Schachtbau GmbH: *See—*
Hungerbach, Paul, 4,111,315, Cl. 214-17.00C.
Tillmanns, Harald: *See—*
Pietzka, Gerhard; and Tillmanns, Harald, 4,111,794, Cl. 208-131.000.
Tinsler, Theodore E., to White-Westinghouse Corporation. Humidifier drive system. 4,112,015, Cl. 261-92.000.
Tioxide Group Limited: *See—*
Lawrence, Leslie John; and Ansbro, Denis, 4,112,035, Cl. 264-113.000.
Tippett, Samuel. Expansion joint. 4,111,582, Cl. 404-47.000.
TMC Corporation: *See—*
Krob, Erwin, 4,111,453, Cl. 280-626.000.
TMC, Inc.: *See—*
Hallberg, John Emil; and Taylor, Otis Max, 4,111,219, Cl. 137-3.000.
Tokarz, Richard D.: *See—*
Peterson, Palmer L.; Duffy, James B.; and Tokarz, Richard D., 4,111,798, Cl. 209-172.500.
Tokico Ltd.: *See—*
Amemori, Hiroyuki; Izumi, Hideki; and Tanaka, Katsuyuki, 4,111,046, Cl. 73-231.00R.
Mutou, Toshiaki, 4,110,888, Cl. 29-404.000.
Toko, Akira: *See—*
Kako, Yuji; Kikuga, Toyoji; and Toko, Akira, 4,112,160, Cl. 428-460.000.
Tokunaga, Michio; Ohhinata, Ichiro; and Okuhara, Shinzi, to Hitachi, Ltd. Constant current circuit. 4,112,346, Cl. 323-4.000.
Tokyo Seimitsu Co. Ltd.: *See—*
Nakada, Takashi; and Takoh, Toshiharu, 4,112,361, Cl. 324-92.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Obiya, Yasuaki; and Ikeda, Saburoo, 4,111,101, Cl. 91-405.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Katakura, Masayuki; and Yamada, Hisashi, 4,112,387, Cl. 330-285.000.
Kusumi, Jiro, 4,112,385, Cl. 330-262.000.
Tomalia, Donald A.; Dickert, Yancey J.; and McCarty, Leslie P., to Dow Chemical Company, The. Method for treating poison ivy dermatitis using certain polyamines and polytertiaryamides. 4,112,067, Cl. 424-78.000.
Tomari, Hitomi: *See—*
Inayoshi, Akio; Ito, Toshimichi; Nagatoshi, Kikuo; Nara, Toshihide; Sagata, Shinsuke; Tomari, Hitomi; Fujimoto, Noriki; and Kaji, Hidehiko, 4,111,898, Cl. 260-42.530.
Tomlinson, Walter John, III, to Bell Telephone Laboratories, Incorporated. Wavelength division multiplexer. 4,111,524, Cl. 350-96.190.
Tomy Kogyo Co., Ltd.: *See—*
Ishida, Hajime, 4,111,447, Cl. 280-278.000.
Tong, George L.: *See—*
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Toray Industries, Inc.: *See—*
Asakura, Toshiyuki; Itoga, Masaaki; Hayakawa, Takeshi; and Tanimura, Masamitsu, 4,112,187, Cl. 428-474.000.
Kikuchi, Yoshikazu; Suzuki, Hirotsugu; and Yabe, Kenji, 4,112,175, Cl. 428-236.000.
Torii, Shinkity; Kawagoshi, Sakae; Yoneshige, Tetsuhiko; and Ito, Hidehumi, to Nissan Motor Company, Limited. Catalyst for oxidation of carbon monoxide and hydrocarbons in combustion engine exhaust gas. 4,111,848, Cl. 252-466.0PT.
Torikai, Eiichi; Kawami, Youji; Kai, Shinichiro; Namba, Mutsusuke; and Simasaki, Shuhei, to Agency of Industrial Science and Technology; and Daikin Kogyo Co., Ltd. Method of making a chemical-resistant diaphragm thereof. 4,111,866, Cl. 521-53.000.
Torkhov, Gennady Fedorovich: *See—*
Lakomsky, Viktor Iosifovich; Sheiko, Ivan Vasilievich; Grigorenko, Georgy Mikhailovich; Torkhov, Gennady Fedorovich; Trigub, Vladimir Kirillovich; Korotkov, Albert Nikitovich; Kurganov, Viktor Mikhailovich; Moshkevich, Evgeny Isaevich; Pakhomov, Alexei Ivanovich; and Verkhovtsev, Emil Vasilievich, 4,112,246, Cl. 13-2.00P.
Torkuhl, Joachim, to Mannesmann Aktiengesellschaft. Preparing tubing or pipelines for submarine installation. 4,110,991, Cl. 405-157.000.
Touron, Serge Auguste: *See—*
Duval, Jean-Claude; Mottini, Francis Joseph; Touron, Serge Auguste; Rennard, Jean-Jacques Francois; and Duval, Ruchela Marie, 4,112,505, Cl. 365-96.000.
Touval, Irving: *See—*
Larkin, William A.; and Touval, Irving, 4,111,905, Cl. 260-45.75B.
Tovi, Murray, to Murray Tovi Designs, Inc. Remotely controlled positioning device for illuminating unit and the like. 4,112,486, Cl. 362-419.000.
Towmotor Corporation: *See—*
Callaghan, William I., 4,111,062, Cl. 74-96.000.
Townend, Robert E., to United States of America, Agriculture. Process for recovering proteinaceous matter from acid whey and tannery unhairing effluents. 4,111,803, Cl. 210-51.000.
Townsend, Robert H., to Xerox Corporation. Exposure system for electrostatic reproduction machines. 4,111,541, Cl. 355-8.000.
Townsend, William L.: *See—*
Zobrist, Gerald J.; Townsend, William L.; and Orr, Steven K., 4,112,425, Cl. 340-347.0AD.
Toy, Stephen M. Semiconductor gas detector circuit. 4,112,356, Cl. 324-71.0SN.
Toyama Chemical Co., Ltd.: *See—*
Saikawa, Isamu; Takano, Shuntaro; Yoshida, Chosaku; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; and Kodama, Yutaka, 4,112,090, Cl. 424-251.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Etoh, Kuniomi; Tanaka, Shinichi; Kato, Yoshio; and Kazuo, Watanabe, 4,111,692, Cl. 96-1.00R.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Mabuchi, Shunsuke; and Tsuzuki, Kenji, 4,112,004, Cl. 568-861.000.
Shiomi, Kozen; and Shimizu, Ryoichi, 4,111,630, Cl. 425-462.000.
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Okuno, Ryuzo; Fujii, Hiroo; and Toyoda, Keio, 4,111,159, Cl. 122-27.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Miyagi, Hideo; Oishi, Kiyohiko; Ishida, Yasuhiko; and Yamaguchi, Shunzo, 4,110,979, Cl. 60-276.000.
Nakamura, Norihiko; and Kawamura, Takahide, 4,111,175, Cl. 123-198.0DC.
Traenckner, Hans-Joachim; Rosenkranz, Hans Jurgen; Fischler, Hans-Michael; and Eimers, Erich, to Bayer Aktiengesellschaft. Unsaturated polyester resins suitable for the production of cross-linked polyesters which are difficult to saponify. 4,112,018, Cl. 260-861.000.
Transat Corp.: *See—*
Buynak, Gabriel Ralph; and Sauerland, Franz Ludwig, 4,112,134, Cl. 427-10.000.
Trefimetaux: *See—*
Moreau, Marc, 4,111,023, Cl. 72-60.000.
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Breuer, Hermann; and Treuner, Uwe, 4,111,978, Cl. 260-465.00D.
Trevillion, Charlie Gene: *See—*
Gibson, Harry S., Jr.; and Trevillion, Charlie Gene, 4,112,355, Cl. 324-57.00R.
Trice, James R., Jr. Reference plane production. 4,111,564, Cl. 356-247.000.
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Lakomsky, Viktor Iosifovich; Sheiko, Ivan Vasilievich; Grigorenko, Georgy Mikhailovich; Torkhov, Gennady Fedorovich; Trigub, Vladimir Kirillovich; Korotkov, Albert Nikitovich; Kurganov, Viktor Mikhailovich; Moshkevich, Evgeny Isaevich; Pakhomov, Alexei Ivanovich; and Verkhovtsev, Emil Vasilievich, 4,112,246, Cl. 13-2.00P.
Trillo, Robert Longley: *See—*
Peissel, Michel Francois; and Trillo, Robert Longley, 4,111,277, Cl. 180-122.000.
Troll, Helmar: *See—*
Ederer, Georg; Fischer, Adolf; Rosche, Paul; Troll, Helmar; Wurst, Wolfgang; Hengl, Helmut; and Seidl, Jiri, 4,111,163, Cl. 123-52.00M.
Trombe, Felix; and Michel, Jacques, to Agence Nationale de Valorisation de la Recherche (Anvar). Dwellings equipped with natural airconditioning installations. 4,111,359, Cl. 237-1.00A.
Truffier, Jean-Claude; Lucotte, Gerard; and Cordonnier, Raymond.

Compositions comprising ovomucoid fraction of white of quail's egg. 4,112,074, Cl. 424-177.000.
TRW Inc.: *See—*
Andrews, James D., 4,111,677, Cl. 65-271.000.
Jones, Robert J.; O'Rell, Michael K.; and Hom, Jim M., 4,111,906, Cl. 528-229.000.
Tschudin & Heid AG: *See—*
Kleeb, Markus, 4,112,277, Cl. 200-153.00J.
Tsou, Ivan H., to Grow Chemical Corp. Method of preparing powder particles by control of the particle shape. 4,112,214, Cl. 528-494.000.
Tsubata, Kazuo, to Hirai, Hironori. Method and apparatus for piecing-up the broken yarn in an open-end spinning system. 4,110,960, Cl. 57-34.00R.
Tsuda, George I.: *See—*
Burnett, Gary L.; and Tsuda, George I., 4,112,398, Cl. 333-73.00R.
Tsuha, Wallace K.; and Schlax, Timothy R. Multifunction sequence operated integrated switch-display device. 4,112,429, Cl. 340-365.00R.
Tsuji, Toshimoto: *See—*
Takase, Katsuji; Tsuji, Toshimoto; Fukuda, Jun-ichi; and Hiyamori, Yasuchika, 4,111,884, Cl. 260-30.60R.
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Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,111,539, Cl. 355-3.00R.
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Tyner, Frederick Carlson. Energy absorbing basketball goal/backboard unit. 4,111,420, Cl. 273-1.50R.
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Uebe, Rudolf: *See—*
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Ueno, Sadayasu: *See—*
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Ueno, Zene; Morita, Akira; Iwaki, Shigeo; Nagaoka, Tadahiko; and Inagaki, Tokuich, to Nissan Motor Company, Limited. Engine operated on hydrogen-supplemented fuel. 4,111,161, Cl. 123-3.000.
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Beard, Charles D.; and Moffitt, Robert B., III, 4,111,999, Cl. 260-606.50B.
Best, Donald Charles, 4,111,840, Cl. 252-432.000.
Cawse, James Norman; and Vidal, Jose Luis, 4,111,975, Cl. 260-449.00L.
D'Silva, Themistocles D. J., 4,111,989, Cl. 260-544.00C.
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Kurtz, Abraham N.; Cunningham, Robert W.; and Naumann, Alfred W., 4,111,983, Cl. 562-535.000.
Pairaudeau, Reginald David; Turnbull, David; and Bevan, Leonard Graham, 4,111,710, Cl. 106-90.000.
Seefried, Carl G., Jr.; Whitman, Robert D.; and Van Cleve, Russell, 4,111,865, Cl. 521-137.000.
Stueben, Kenneth Charles, 4,111,769, Cl. 204-159.150.
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Agriculture: *See—*
Connick, William J., Jr.; and Ellzey, Samuel E., Jr., 4,111,700, Cl. 106-2.000.
Townend, Robert E., 4,111,803, Cl. 210-51.000.
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Everswick, David N., 4,112,317, Cl. 307-308.000.
Lytle, John David; and Combs, James M., 4,110,912, Cl. 33-312.000.
Northup, Robert Powers, 4,111,074, Cl. 74-867.000.
Schmidlin, Albertus E., 4,111,127, Cl. 102-237.000.
Smith, Chester L.; and Everswick, David N., 4,111,559, Cl. 356-201.000.
Thurston, Bruce E.; Owens, Albert H.; and Pocsi, Powell J., 4,111,513, Cl. 339-143.00R.
Zangrando, Roy A., 4,112,267, Cl. 200-43.000.
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Energy: *See—*
Barnette, Jon H., 4,111,017, Cl. 70-293.000.
Eck, John E.; and Kasberg, Alvin H., 4,111,747, Cl. 176-40.000.
Evans, A. Gary, 4,111,833, Cl. 252-429.00R.
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Bonisch, Frank Henry. Locking redundant link. 4,111,068, Cl. 74-586.000.
Layland, James W.; Martin, Warren L.; Zygielbaum, Arthur I.; Goldstein, Richard M.; and Hubbard, William P. Digital demodulator-correlator. 4,112,497, Cl. 364-728.000.
Perkins, Gerald S. Sun tracking solar energy collector. 4,111,184, Cl. 126-270.000.
Thompson, Wallace W. Inhibited solid propellant composition containing beryllium hydride. 4,111,729, Cl. 149-19.900.
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Hollis, Ben R., Jr.; Feltner, William R.; Bouldin, David L.; and Routh, Donald E., 4,111,775, Cl. 204-192.00C.
Livermore, Stephen F., 4,112,357, Cl. 324-72.000.
Morris, James F., 4,111,718, Cl. 136-236.00R.
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Shai, Michael Charles, 4,111,851, Cl. 252-518.000.
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Kershaw, Joseph E., 4,112,394, Cl. 333-6.000.
Kissinger, Charles W., 4,111,382, Cl. 244-3.100.
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Boer, Melle; and Rentema, Albertus Pieter, 4,110,906, Cl. 30-43.920.
Duistermaat, Jan Hendrik; and van Nes, Johannes Cornelis Adrianus, 4,111,694, Cl. 96-36.100.
Goddijn, Bernardus Henricus Antonius, 4,112,345, Cl. 318-696.000.
Spoelder, Gerrit Adriaan, 4,112,514, Cl. 365-222.000.
Steinkopf, Wolfgang Otto Gotthard; and Drabek, Rudolf, 4,112,445, Cl. 358-127.000.
Strijker, Hendrik Willem, 4,110,905, Cl. 30-43.600.
Van Mal, Harmannus Hinderikus; and Ferguson, Eric Tapley, 4,111,002, Cl. 62-467.00R.
Verbeek, Thomas Geert; and de Vaan, Robertus Laurentius Clemens, 4,112,331, Cl. 315-125.000.
Zwaneburg, Dirk Jan, 4,111,970, Cl. 260-438.50R.
U.S. Phillips Corporation: *See—*
Alais, Pierre; and Auphan, Michel Joseph, 4,112,411, Cl. 340-1.00R.
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United States Steel Corporation: *See—*
Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, 4,110,889, Cl. 29-407.000.
Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,111,759, Cl. 203-7.000.
Kachik, Robert H., 4,110,887, Cl. 29-401.00A.
Krelis, Peter S.; and Prox, Larry M., 4,111,405, Cl. 266-158.000.
United Technologies Corporation: *See—*
Anderson, William S., 4,112,191, Cl. 428-497.000.
Back, Paul R.; and Van Vessem, Thomas G., 4,112,351, Cl. 324-16.00R.
Day, Edward G.; and Dziobek, Edmund, 4,111,252, Cl. 164-23.000.

Elam, Richard C.; and Ulion, Nicholas E., 4,110,893, Cl. 29-420.500.
Kenigsberg, Irwin Jeffrey; and Eastman, Larry Bruce, 4,111,386, Cl. 244-17.270.
Lemkey, Franklin David, 4,111,723, Cl. 148-32.000.
Mangum, Norman W., Jr.; and Ripy, Howard W., 4,112,499, Cl. 364-732.000.
McLafferty, George H., 4,112,388, Cl. 331-94.50D.
Prewo, Karl Michael, 4,111,606, Cl. 416-224.000.
Rothman, Edward A.; and Carlson, Charles E. K., 4,111,600, Cl. 416-2.000.
Van Vessem, Thomas G.; and Back, Paul R., 4,112,350, Cl. 324-16.00R.
Young, John H.; and Goetz, Gerald F., 4,110,972, Cl. 60-230.000.

University of California, The Regents of the: *See*—
Freeman, Daniel L.; Bettencourt, Darryl G.; and Marshall, George E., Jr., 4,111,210, Cl. 130-30.00R.
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Lin, Chiu-Hong, 4,111,969, Cl. 260-410.90R.
Moon, Malcolm W.; and Kornis, Gabriel, 4,111,939, Cl. 260-293.600.
Moon, Malcolm W.; and Kornis, Gabriel, 4,111,941, Cl. 260-293.600.
Nelson, Norman A., 4,111,995, Cl. 260-590.00C.
Nelson, Norman A., 4,111,996, Cl. 260-590.00D.
Smith, Curtis P.; and Ulrich, Henri, 4,112,014, Cl. 260-945.000.

Uva, Pasquale A. Composition of heel base for shoes. 4,111,875, Cl. 260-23.00R.

V E B Jenapharm: *See*—
Schmidt, Joachim; Weigelt, Christian; Bamberg, Wolfgang; and Schneider, Wolfgang, 4,111,987, Cl. 562-401.000.

Valeev, Rustem Ibragimovich: *See*—
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Van der Gucht, William: *See*—
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van der Lely, Ary, to C. van der Lely NV. Soil cultivating machines. 4,111,265, Cl. 172-59.000.

van der Lely, Cornelis. Soil tilling machines. 4,111,263, Cl. 172-54.000.

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Vanderlyn, Donald. Anchoring system. 4,110,940, Cl. 52-23.000.

Van Mal, Harmannus Hinderikus; and Ferguson, Eric Tapley, to U.S. Philips Corporation. Cyclic desorption refrigerator and heat pump, respectively. 4,111,002, Cl. 62-467.00R.

van Montfoort, Abraham; and Scholten, Joseph J. F., to Stamicarbon, B.V. Process for the preparation of supported catalysts. 4,111,842, Cl. 252-447.000.

Van Natta, Cletus L., to Conwed Corporation. Mineral fiberizing wheel. 4,111,673, Cl. 65-6.000.

van Nes, Johannes Cornelis Adrianus: *See*—
Duistermaat, Jan Hendrik; and van Nes, Johannes Cornelis Adrianus, 4,111,694, Cl. 96-36.100.

Van Pool, Joe; and Jackson, R. Neil, to Phillips Petroleum Company. Separation of solvent from liquid sulfur. 4,111,805, Cl. 210-71.000.

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Van Veelen, George Frans: *See*—
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Van Vessem, Thomas G.; and Back, Paul R., to United Technologies Corporation. Negative and positive switching ignition signal conditioner. 4,112,350, Cl. 324-16.00R.

Van Vessem, Thomas G.: *See*—
Back, Paul R.; and Van Vessem, Thomas G., 4,112,351, Cl. 324-16.00R.

van Wersch, Hubert Maria Agnes; Herrling, Siegfried; and Muckter, Heinrich. Diazaborines and drug compositions. 4,112,077, Cl. 424-185.000.

Varco, Inc.: *See*—
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Varley, Bernard Scott, to Automatic Grinding Machine & Engineering Co. Ltd. Grinding machine. 4,111,075, Cl. 76-41.000.

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Varvel, David Anthony; Millar, Frederick William; and Farquharson, Stuart Connall, to Access Control Systems Proprietary Limited. Magnetic identification apparatus. 4,112,292, Cl. 235-449.000.

Vayda, Michael Mark, Jr. Single-stop shopping facility and method. 4,111,282, Cl. 186-1.00C.

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VEB Polygraph Leipzig, Kombinat fuer Polygraphische Maschinen und Austruestungen: *See*—
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Veith, Werner, to Siemens Aktiengesellschaft. Gas discharge display device. 4,112,329, Cl. 313-491.000.

Veith, Werner; and Bechteler, Martin, to Siemens Aktiengesellschaft. Matrix-addressed gas-discharge display device for multi-colored data display. 4,112,332, Cl. 315-169.0TV.

Velsicol Chemical Company: *See*—
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Vennemeyer, Alfred C.; and Ernst, Richard A., to General Motors Corporation. Powder metal crown gear forming process. 4,111,031, Cl. 72-359.000.

Ventura, John A.: *See*—
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Venturi, Luigi. Piezoelectric gas igniter using open frame. 4,112,322, Cl. 310-339.000.

Verbeek, Thomas Geert; and de Vaan, Robertus Laurentius Clemens, to U.S. Philips Corporation. Device for improving the efficiency of a low-pressure sodium vapor discharge lamp. 4,112,331, Cl. 315-125.000.

Verchere, Maurice. Coupling. 4,110,873, Cl. 24-230.00R.

Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See*—
Sigott, Siegfried; Suessenbeck, Heinrich; Zitz, Alfred; and Siebenhofer, Gottfried, 4,111,227, Cl. 137-469.000.
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Vernon, Richard H., to Xerox Corporation. Meniscus dampening drop generator. 4,112,433, Cl. 346-1.000.

Versteeg, Frits Johan, to N.V. Optische Industrie "de Oude Delft". Magnifier. 4,111,528, Cl. 350-175.00E.

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Vest, Eugene W., to Texaco Inc. Extendable fuel dispensing nozzle. 4,111,244, Cl. 141-348.000.

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Vice, George A. Child-proof cabinet. 4,111,505, Cl. 312-209.000.

Victor, William E., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Arctic tent pole. 4,111,217, Cl. 135-15.0PQ.

Vidal, Jose Luis: *See*—
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Viglia, Aurelio: *See*—
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Vilain, Robert, to Entreprise d'Equipements Mecaniques et Hydrauliques EMH. Fluid-tight sealing devices. 4,111,435, Cl. 277-9.000.

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Vishnevsky, Alexandr Alexandrovich; Korolkov, Ivan Alexandrovich; Smirnov, Boris Andreevich; Ivanova, Tatyana Lukyanovna; Adamian, Arnold Aramovich; and Mitkova, Galina Vladimirovna. Surgical instrument for applying metal staples to organs and tissues and for simultaneous division thereof. 4,111,206, Cl. 128-305.000.

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Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Pyrazolo(1,5-c)quinazoline derivatives and related compounds. 4,112,096, Cl. 424-251.000.
Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Pyrazolo[1,5-c]quinazoline derivatives and related compounds. 4,112,098, Cl. 424-251.000.
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von Beckmann, Helmuth, to Canron Railgroup. Method and apparatus for the vibratory tamping of railway tracks. 4,111,129, Cl. 104-12.000.
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Waddoups, Ray O., to International Telephone and Telegraph Corporation. Thermometer with birefringent sensing element in fiber optic coupling. 4,111,050, Cl. 73-362.00R.
Wade, Jackie F.; Peyton, John E.; Klitzky, Bruce R.; and Groff, Roy E., to Martin Marietta Corporation. Optically black coating and process for forming it. 4,111,762, Cl. 204-33.000.
Wagatsuma, Kazuo: *See—*
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,111,932, Cl. 260-239.100.
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Waldman, Harold L.: *See—*
Beede, Charles H.; Waldman, Harold L.; and Blumig, Theodore, 4,111,922, Cl. 526-292.000.
Waldman, Harold Louis, to Johnson & Johnson. Pressure sensitive adhesive tapes and method of making same. 4,112,213, Cl. 526-279.000.
Waldorf, Lindsey E.; and Monroe, Kenneth E., to Patents Licensing International, Ltd. Automatically stabilized oscillator. 4,112,393, Cl. 331-109.000.
Walker, Brian; Hunter, George Sherwood; and Hunter, Susanne Phyllis, to Process Scientific Innovations Limited. Filter elements for gas or liquid and methods of making such elements. 4,111,815, Cl. 210-487.000.
Walker, Thomas Bruce; Seider, Robert J.; and Cichy, Paul, to Carborundum Company, The. Fused aluminum oxide abrasive grain containing reduced titanium oxide. 4,111,668, Cl. 51-309.00A.
Wall, Lawrence S., to Texas Instruments Incorporated. Electrically alterable floating gate semiconductor memory device. 4,112,509, Cl. 365-185.000.
Wallace Murray Corporation: *See—*
Brummett, Earl Ray, 4,111,289, Cl. 192-58.00B.
Walnut Sand & Gravel Co.: *See—*
Nelson, Richard L., 4,111,314, Cl. 214-17.00A.
Walser, Armin; and Fryer, Rodney Ian, to Hoffmann-La Roche Inc. 1,2,3,5-Tetrahydro-4H-1,5-benzodiazepine-4-ones. 4,111,931, Cl. 260-239.30B.
Walser, Armin: *See—*
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Walters, Chester H.: *See—*
Wright, David A.; and Walters, Chester H., 4,111,806, Cl. 210-115.000.
Walus, Aloysius Norbert: *See—*
Den Hartog, Herman Charles; and Walus, Aloysius Norbert, 4,111,870, Cl. 260-21.000.
Wan, John P., to Electrohome Limited. Brush holder and brush assembly for a dynamoelectric machine. 4,112,321, Cl. 310-242.000.
Wang, Donald S. T., to Monsanto Company. Storage stable polyol mixture. 4,111,828, Cl. 252-182.000.
Wang, Robert: *See—*
Kissel, Roland; and Wang, Robert, 4,111,154, Cl. 118-10.000.
Wappler, Joachim Harold Richard. Truck mounted hoist. 4,111,316, Cl. 214-75.00H.
Ward, Frank, deceased (by Ward, Robina Rutherford Flucker, legal representative); Hildreth, John David; and Potts, Herbert Alexander, to Ciba-Geigy AG. Dyestuff preparations and processes for their production. 4,111,649, Cl. 8-41.00R.
Ward, James E.: *See—*
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Ward, James W.: *See—*
Seliger, Robert L.; and Ward, James W., 4,112,455, Cl. 357-23.000.
Ward, Robina Rutherford Flucker, legal representative: *See—*
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Ward, William H.; Henderson, Henry F., Jr.; and Kardux, Kenneth H., to H. F. Henderson Industries. Weight loss control system. 4,111,336, Cl. 222-58.000.
Warncke, Ernst; and Gdulla, Manfred, to Dragerwerk Aktiengesellschaft. Respiratory device coupling construction. 4,111,197, Cl. 128-142.400.
Warner-Lambert Company: *See—*
Butler, Donald Eugene, 4,111,943, Cl. 260-294.80D.
Warner & Swasey Company, The: *See—*
Breeding, Robert D., 4,111,320, Cl. 214-145.00A.
Warwick, Leonard A.: *See—*
Bosy, George; Edwards, Edwin N.; Hoffbeck, Willis M.; Silvio, Paul A.; and Warwick, Leonard A., 4,112,131, Cl. 426-582.000.
Waski, Jane, to Janys Designs Limited. Game apparatus. 4,111,429, Cl. 273-271.000.
Wasylchak, Russell W.: *See—*
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Watanabe, Iwao, to Matsushita Electric Industrial Company, Limited. Fluid exhausting device. 4,111,615, Cl. 417-423.00A.
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Watts, William A.: *See—*
Creekmore, Mark D.; and Watts, William A., 4,112,158, Cl. 428-35.000.
Waugh, Richard A., to General Electric Company. Additive dispensing system. 4,111,011, Cl. 68-17.00R.
Wawrzyniak, Walter W. Floating tool holder. 4,111,442, Cl. 279-16.000.
Webb, John T. H.: *See—*
Alexander, William; and Webb, John T. H., 4,111,398, Cl. 254-175.500.
Weber, Harold James. Apparatus including bivolumetric tone subaudition means for positionally spotting and tracing subjacently concealed conductive structures. 4,112,349, Cl. 324-3.000.
Webster, Raymond George, to Edbro Limited. Mechanisms for loading and unloading containers onto and from a vehicle. 4,111,321, Cl. 214-501.000.
Weemes, Doyle A.: *See—*
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Weetall, Howard H., to Corning Glass Works. Comparative test for Neisseria. 4,111,752, Cl. 195-103.50M.
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Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,112,109, Cl. 424-273.00P.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,112,227, Cl. 424-273.00P.
Weibull, Bengt John Gustaf; and Thorsell, Leif Urban Folke, to Berol Kemi AB. Process for the condensation of epoxides with organic compounds having an active hydrogen. 4,112,231, Cl. 544-174.000.

Weigand, Dwayne R. Fishing rod and projectile firing gun. 4,110,929, Cl. 43-19.000.
Weigelt, Christian: *See—*
Schmidt, Joachim; Weigelt, Christian; Bamberg, Wolfgang; and Schneider, Wolfgang, 4,111,987, Cl. 562-401.000.
Weigt, Donald A.: *See—*
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Weihrauch, Georg, to Coronet-Werke Heinrich Schlerf GmbH. Handle mounting for cleaning implements. 4,110,870, Cl. 16-114.00R.
Weikel, Donald J., Jr., to Xerox Corporation. Corona wire mounting means. 4,112,298, Cl. 250-324.000.
Wein, William J.: *See—*
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Weinberger, Lawrence P.: *See—*
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Weisang, Joseph-Edouard; and Engelhard, Philippe, to Compagnie Francaise de Raffinage. Catalysts for the hydrotreatment of hydrocarbons and a process for preparation and application of said catalysts. 4,111,841, Cl. 252-439.000.
Weisberg, Warren. Apparatus for forming, filling and sealing bags made from flattened plastic tubular plastic stock. 4,110,956, Cl. 53-558.000.
Weiss, Martin Joseph, to American Cyanamid Company. 15,16-Dioxy prostenoic acids and esters and intermediates in their preparation. 4,111,959, Cl. 260-340.90R.
Weiss, William Robert; Cooksey, James Judson; and Gordon, Rob Roy, Jr., to Allied Chemical Corporation. Jet muffler. 4,110,876, Cl. 28-271.000.
Weissenfels, Franz; and Junger, Hans, to Dynamit Nobel Aktiengesellschaft. Method of hardening liquid resols. 4,111,911, Cl. 260-38.000.
Welcker, Friedrich. Releasable coupling and method for making such coupling. 4,111,470, Cl. 285-320.000.
Welland, John M., to Perkin-Elmer Corporation, The. Vent control for a thermal system. 4,111,643, Cl. 432-48.000.
Wells, James W.; and Watts, Loyd A. Repair device for pipes. 4,111,234, Cl. 138-99.000.
Wells, Thomas R., to Bell & Howell Company. Optical structure for microfiche reader. 4,111,149, Cl. 353-78.000.
Wells, Thomas R.; and Dahlen, Theodore E., to Bell & Howell Company. Optical structure for microfiche reader. 4,111,537, Cl. 353-101.000.
Wellworthy Limited: *See—*
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Wendler, Gunter K.; Corpus, Enrique; and Ohannesian, Michael J. Tool for removing injectors from diesel engines. 4,110,886, Cl. 29-255.000.
Wentz, John L., to Westinghouse Electric Corp. Charge coupled device circuit with increased signal bandwidth. 4,112,316, Cl. 307-304.000.
Wenzel, Kurt. Method for manufacturing an impregnated wound foil capacitor. 4,110,878, Cl. 29-25.420.
Wescom, Inc.: *See—*
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Wesley, John G., to Labelette Company. Apparatus for labeling sheeting rolls. 4,111,737, Cl. 156-458.000.
West Electric Co, Ltd.: *See—*
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West, Gene A.; and Hamren, Glen C., to General Motors Corporation. Engine knock signal generating apparatus with noise channel inhibiting feedback. 4,111,035, Cl. 73-35.000.
West, Theodore H., to Exxon Research & Engineering Co. Dilution chilling dewaxing solvent. 4,111,790, Cl. 208-33.000.
Western Electric Company, Inc.: *See—*
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Westhoff, Hermann: *See—*
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Bolin, Philip C., 4,111,511, Cl. 339-64.00R.
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Ewanus, Walter; and Sage, Gerald F., 4,112,368, Cl. 325-32.000.
Ho, Shih M.; and Gupta, Tapan K., 4,111,852, Cl. 252-518.000.
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Stahl, William F., 4,111,603, Cl. 416-95.000.
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White, Marvin Hart; and Lampe, Donald Ross, to Westinghouse Electric Corp. Addressable MNOS cell for non-volatile memories. 4,112,507, Cl. 365-184.000.
White, Robert I. Synchronizing control system. 4,112,479, Cl. 361-243.000.
White Sea & Baltic Company Limited, The: *See—*
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Wiegand, James B., to Solar Energy Research Corp. Modular solar radiation collector. 4,111,187, Cl. 126-271.000.
Wiegard, Klaus, to Daimler-Benz Aktiengesellschaft. Seal for rotating heat exchanger. 4,111,257, Cl. 165-9.000.
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Wilhelm, Wilhelm, to Siemens Aktiengesellschaft. Device for the transmission of push-pull signals across a two-wire line in full duplex operation. 4,112,253, Cl. 178-58.00R.
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Willeitner, Eberhard, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Bending-resistant gripper carriage support structure, particularly for offset printing machines. 4,111,123, Cl. 101-407.00A.
Willems, Jozef Frans: *See—*
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Williams, Charles F., to Teledyne Penn-Union. Electrical conductor for a bushing and method of making an electrical bushing. 4,112,043, Cl. 264-250.000.
Williams, Ian Gabriel: *See—*
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Williamson, Hilding Victor, to Chemetron Corporation. Method and apparatus for carbon dioxide snow separation. 4,111,671, Cl. 62-10.000.

Williamson, Robert W. Safety mechanism for presses, machines and fixtures. 4,111,232, Cl. 137-882.000.

Willis, Donald Henry, to RCA Corporation. Thrush current start-up circuit for a television receiver including a start-up decoupling circuit. 4,112,465, Cl. 358-190.000.

Willsey, Charles H. Separating mechanism for egg breaking machine. 4,111,111, Cl. 99-499.000.

Wilson, George E.; Friesen, Milo E.; and Smith, Albert J., to Houdaille Industries, Inc. Method of and apparatus for jet aeration. 4,112,025, Cl. 261-29.000.

Wilson, Leslie Henry. Transport vehicles. 4,111,312, Cl. 214-6.00B.

Wilson, Phillip Steven: *See*—
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Wilson, S. R.; and Jones, D. B., to General Electric Company. Capacitor protective device. 4,112,474, Cl. 361-15.000.

Winchell, David A., to Baxter Travenol Laboratories, Inc. Hermetically sealed tamperproof port protector. 4,111,324, Cl. 215-232.000.

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Wing, George S., to Hi-Shear Corporation. Unitary lockable turnbuckle. 4,111,568, Cl. 403-2.000.

Wingrave, James A., to Continental Oil Company. Polyvinyl chloride having improved antistatic properties. 4,112,206, Cl. 526-3.000.

Winkler, Charles L.; and Eichler, Kenneth M., to Westinghouse Electric Corp. Elevator system. 4,111,284, Cl. 187-29.00R.

Winn, Fred M., Jr.; and Harris, Monty E., to Dow Chemical Company, The. Ball injector. 4,111,334, Cl. 221-75.000.

Winn, Martin; Kyncl, Jaroslav; Dunnigan, Daniel Ambrose; and Jones, Peter Hadley, to Abbott Laboratories. Antihypertensive agents. 4,112,097, Cl. 424-251.000.

Winters, Harry K., to University of California, The Regents of the. Shake responsive valve. 4,111,220, Cl. 137-39.000.

Wintzer, Klaus: *See*—
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Hofer, Ernst; Hirschmann, Peter; and Wintzer, Klaus, 4,112,427, Cl. 340-347.00C.

Wireman, Wallace H. Ground and polarity monitoring apparatus including means to correct improper polarity. 4,111,516, Cl. 339-113.00R.

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Wittle, Eugene Leroy; Rebstock, Mildred Catherine; Nicolaides, Ernest D.; and Campbell, Alfred, to Parke, Davis & Company. Octapeptides and methods for their production. 4,111,923, Cl. 260-112.50R.

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Wolfe, Robert W.; and Messier, Russell F., to GTE Sylvania Incorporated. Barium magnesium fluoride phosphors and lamps and X-ray screens embodying same. 4,112,328, Cl. 313-486.000.

Wolk, Ronald H.; and Stewart, Norman C., to Electric Power Research Institute, Inc. Reactor for solvent refined coal. 4,111,663, Cl. 422-191.000.

Wolvek, Sidney; Hanson, Bruce L.; and Bregman, David, to Datascope Corporation. Topical hypothermia apparatus and method for treating the human body and the like. 4,111,209, Cl. 128-400.000.

Wong, Mon N.; and Crail, Timothy A., to Hughes Aircraft Company. Square horn antenna having improved ellipticity. 4,112,432, Cl. 343-786.000.

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Wood, Dennis Charles: *See*—
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Wood, Keith William, to International Computers Limited. Data processing systems. 4,112,489, Cl. 364-200.000.

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Woodhams, Raymond T.; and Xanthos, Marinos, to Canadian Patents and Development Limited. Preparing mica-reinforced composites. 4,112,036, Cl. 264-28.000.

Woodmansee, Wayne Earl: *See*—
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Wright, David A.; and Walters, Chester H., to National Marine Service, Inc. Gravitational separator for mixtures of immiscible liquids of different densities. 4,111,806, Cl. 210-115.000.

Wright, Hal Eldon; and Berwick, Martin Alfred, to Eastman Kodak Company. Multilayer aggregate photoconductive elements. 4,111,693, Cl. 96-1.600.

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Wu, An-Chuan. Biological tissue exercising device. 4,111,192, Cl. 128-38.000.

Wu, Yulin, to Phillips Petroleum Company. Preparation of vicinal epoxides. 4,111,965, Cl. 260-348.160.

Wuerfel, Robert P. Variable displacement arrangement in four cycle, reciprocating internal combustion engine. 4,111,164, Cl. 123-78.00E.

Wulff, Gunter; and Sarhan, Ali, to Dynamit Nobel Aktiengesellschaft. Method of preparing polymers analogous to enzymes. 4,111,863, Cl. 521-63.000.

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Maret, Arthur R., 4,111,546, Cl. 355-15.000.
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Yamaguchi, Kazumasa; Nasaki, Kunio; and Ohshiro, Masanori, to Kabushiki-Kaisha Kinsekisha-Kenkyujo. Mounting for plural piezoelectric vibrator units. 4,112,324, Cl. 310-353.000.

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Yamaoka, Kojiro; Mihara, Toshihide; and Tanaka, Akira, to Kanzaki Kokyukoki Mfg. Co., Ltd. Machine tool. 4,110,898, Cl. 29-568.000.

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Yamashita, Nobuo, to Olympus Optical Co., Ltd. Optical system for an endoscope. 4,111,529, Cl. 350-225.000.

Yamauchi, Satoshi, to Ricoh Co., Ltd. System for repeatedly reproducing a recorded material of a limited duration. 4,112,470, Cl. 360-88.000.

Yamawaki, Takeshi; Hoshijima, Tokitaro; and Aga, Kiichiro, to Mitsubishi Kasei Kogyo Kabushiki Kaisha. Apparatus for measuring the hardness of rubber. 4,111,039, Cl. 73-81.000.

Yanik, Stephen J.; Montagna, Angelo A.; and Frayer, James A., to Gulf Research & Development Co. Method for presulfiding hydrodesulfurization catalysts. 4,111,796, Cl. 208-216.000.

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Yokoyama, Nobuaki, to Silver Seiko Ltd. Yarn changing device in a flat-bed knitting machine. 4,111,007, Cl. 66-125.00R.

Yonemoto, Tomoo; Morino, Yukio; Ishida, Hiroaki; and Nagaoka, Shinji, to Seiko Koki Kabushiki Kaisha. Camera with photoflash means and data photographic means operated with single battery. 4,112,444, Cl. 354-106.000.

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Yoshida, Eiichi; Nakao, Hideo; Goto, Norimasa; Sugiyama, Toul; and Kashiwaya, Sadao, to Nissan Motor Company, Limited. Method of using filling solder for automobile body. 4,112,141, Cl. 427-142.000.

Yoshida Kogyo K.K.: *See*—
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Akashi, Shunji, 4,110,891, Cl. 29-408.000.

Yoshida, Muneo: *See*—
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Yoshida, Tomio: *See*—
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Young, Alastair John, to Automotive Products Limited. Vehicle braking system including valves for braking modulation during cornering. 4,111,494, Cl. 303-6.00C.

Young, James, to J. Young (Scientific Glassware) Ltd. Sealing members. 4,111,440, Cl. 277-165.000.

Young, John H.; and Goetz, Gerald F., to United Technologies Corporation. Seal means for a movable centerbody in a two dimensional nozzle. 4,110,972, Cl. 60-230.000.

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Zanow, Andrey L., to Midland-Ross Corporation. Cushioning device. 4,111,406, Cl. 267-153.000.

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Zens, John F., to General Motors Corporation. Hinge mechanism for a sliding door. 4,110,934, Cl. 49-218.000.

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Zimmerman, Richard E.: *See*—
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Zimmerschied, Wilford J., to Standard Oil Company (Indiana). Butane oxidation to acetic acid. 4,111,986, Cl. 562-549.000.

Zitz, Alfred: *See*—
Sigott, Siegfried; Suessenbeck, Heinrich; Zitz, Alfred; and Siebenhofer, Gottfried, 4,111,227, Cl. 137-469.000.
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Zobrist, Gerald J.; Townsend, William L.; and Orr, Steven K., to Zonic Technical Laboratories, Inc. Transient analog signal capture and transmission system. 4,112,425, Cl. 340-347.0AD.

Zonic Technical Laboratories, Inc.: *See*—
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Zuckerman, Robert E.; and Merendino, Michael J. Fluid parameter sensing apparatus. 4,111,048, Cl. 73-338.000.

Zuev, Alexandr Borisovich; and Miller, David Samuilovich. Method and apparatus for producing a conduit intended for communication with a plurality of working-medium sources. 4,110,894, Cl. 29-527.600.

Zulehner, Werner: *See*—
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Zurbuchen, Jacques; Leutenegger, Willi; and Calcaterra, Luigi, to Ciba-Geigy AG. Fine particle application of dyes or optical brightener to leathers or fabrics in a tumbling drum at low volumes in a hydrophobic solvent. 4,111,645, Cl. 8-1.00W.

Zurcher, Rudolf F., to Hughes Aircraft Company. Flexible circuit/flat cable to circuit board edge connector for electronic wrist watches, calculators and the like. 4,111,510, Cl. 339-17.00F.

Zurcher, Rudolf F., to Hughes Aircraft Company. Quick connect and non-destructive disconnect electrical wiring-connector device. 4,111,518, Cl. 339-252.00R.

Zwaneburg, Dirk Jan, to U.S. Philips Corporation. Method of producing chromium (III)-N-acyl-anthranilates. 4,111,970, Cl. 260-438.50R.

Zygielbaum, Arthur I.: *See*—
United States of America, National Aeronautics and Space Administration; Layland, James W.; Martin, Warren L.; Zygielbaum, Arthur I.; Goldstein, Richard M.; and Hubbard, William P., 4,112,497, Cl. 364-728.000.

3C Chemical Laboratories Pty. Limited: *See*—
Cheng, Robin; and Cross, Kenneth MacLean, 4,111,338, Cl. 222-180.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 5TH DAY OF SEPTEMBER, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Blatzer, Bruce T., to Caterpillar Tractor Co. Apparatus and method for electrically heating a moving wire containing treating agents. T974,002, 9-5-78, Cl. 219-155.000.

Caterpillar Tractor Co.: *See*—
Blatzer, Bruce T., T974,002, Cl. 219-155.000.

Neal, James G., T974,001, Cl. 214-140.000.

Millen, Edward G. Cure accelerator for polysulfide polymer based sealants. T974,003, 9-5-78, Cl. 528-374.000.

Neal, James G., to Caterpillar Tractor Co. Guard for tilt cylinder hoses and fittings. T974,001, 9-5-78, Cl. 214-140.000.

LIST OF REISSUE PATENTEES

TO WHOM

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bell & Howell Company: *See*—
Perkins, George D.; and Colbert, John R., Re. 29,755, Cl. 310-329.000.

Blackman, Seymour N. Clinical glass thermometer having a stem and a bulb integrally formed therewith. Re. 29,750, Cl. 73-371.000.

Colbert, John R.: *See*—
Perkins, George D.; and Colbert, John R., Re. 29,755, Cl. 310-329.000.

Elias, Abram G.; and Elias, Peter G. Means for filing documents. Re. 29,751, Cl. 312-184.000.

Elias, Peter G.: *See*—
Elias, Abram G.; and Elias, Peter G., Re. 29,751, Cl. 312-184.000.

Fromson, Howard A. Process and apparatus for continuously anodizing aluminum. Re. 29,754, Cl. 204-28.000.

Gold, Nicholas, to Polaroid Corporation. Photographic film assemblage and apparatus. Re. 29,756, Cl. 354-85.000.

Harvey Hubbell, Incorporated: *See*—
Jaconette, Frank C., Jr., Re. 29,752, Cl. 339-14.00R.

Jaconette, Frank C., Jr., to Harvey Hubbell, Incorporated. Grounding clip for electrical fixtures. Re. 29,752, Cl. 339-14.00R.

Perkins, George D.; and Colbert, John R., to Bell & Howell Company. Piezoelectric transducer having a crystal orientation selected from (xyl) + 31.7° (±1°) and (xyl) + 76.7° (±1°) or symmetrical equivalent. Re. 29,755, Cl. 310-329.000.

Polaroid Corporation: *See*—
Gold, Nicholas, Re. 29,756, Cl. 354-85.000.

United States Gypsum Company: *See*—
Williams, Terrance L., Re. 29,753, Cl. 106-85.000.

Williams, Terrance L., to United States Gypsum Company. Asbestos-free joint compounds. Re. 29,753, Cl. 106-85.000.

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Armstrong Nurseries, Inc.: *See*—

McGredy, Samuel, IV, 4,297, Cl. 28.000.

Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA": *See*—
Holtkamp, Reinhold, 4,296, Cl. 69.000.

Holtkamp, Reinhold, to Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA". African violet plant. 4,296, 9-5-78, Cl. 69.000.

McGredy, Samuel, IV, to Armstrong Nurseries, Inc. Rose plant. 4,297, 9-5-78, Cl. 28.000.

LIST OF DESIGN PATENTEES

American Can Company: *See*—
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Gibbs, Terence E., 249,249, Cl. D10-106.000.

American National Red Cross: *See*—
Schwartz, Robert T.; and Harrison, Marc S., 249,204, Cl. D6-38.000.

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Backlund, Sigurd Alfons. Exhaust valve of respiratory mask. 249,279, 9-5-78, Cl. D24-7.000.

Balland, Jean-Claude; and Lecomte, Philippe, to Ciba-Geigy AG. Container for air-treating composition. 249,277, 9-5-78, Cl. D23-150.000.

Banez, Armin V. Rack for fiberoptic scopes or the like. 249,210, 9-5-78, Cl. D6-114.000.

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Beaubien, Thomas S.; Larsen, Harold H.; and Oehring, Robert E., to Bates Industries, Inc. Motorcycle fairing. 249,257, 9-5-78, Cl. D12-182.000.

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Gibbs, Terence E., to American District Telegraph Company. Control unit housing for an electrical protection system. 249,249, 9-5-78, Cl. D10-106.000.

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Gill, Hilton A., to R-Way Furniture Company. Arm chair. 249,206, 9-5-78, Cl. D6-73.000.

Gill, Hilton A. Desk. 249,212, 9-5-78, Cl. D6-161.000.

Graham, Roger. Smoking device. 249,281, 9-5-78, Cl. D27-03.000.

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Neece, Roy M. Base for mounting audio equipment in a vehicle. 249,263, 9-5-78, Cl. D14-10.000.
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Schulman, Stanley W. Hairdress protector. 249,198, 9-5-78, Cl. D2-241.000.
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Van der Veken, Germaine. Combined packaging container and toy construction block. 249,232, 9-5-78, Cl. D9-167.000.
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CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 5, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

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55	4,110,931

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92	4,111,681
98	4,111,682
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867	4,111,074

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CLASS 122

4 D	4,111,158
27	4,111,159

CLASS 123

1 A	4,111,160
3	4,111,161
32 EE	4,111,162
32 SA	4,111,178
32 ST	4,111,177
32 M	4,111,163
78 E	4,111,164
90.15	4,111,165
97 B	4,111,166
102	4,111,167
117 A	4,111,168
119 A	4,111,172
119 EC	4,111,169
	4,111,170
	4,111,171
139 AQ	4,111,173
148 CC	4,111,174
198 DB	4,111,176
198 DC	4,111,175

CLASS 124

7	4,111,179

CLASS 125

35	4,111,180

CLASS 126

77	4,111,181
110 B	4,111,182
270	4,111,183
	4,111,184
271	4,111,185
	4,111,186
	4,111,187
	4,111,188

400 4,111,189

CLASS 127

46 A 4,111,714

CLASS 128

2 A 4,111,190
2.05 F 4,111,191
38 4,111,192
66 4,111,193
80 C 4,111,194
83 4,111,195
130 4,111,196
142.4 4,111,197
214 E 4,111,198
214 R 4,111,199
233 4,111,200
260 4,111,201
4,111,202
4,111,203
276 4,111,204
284 4,111,205
305 4,111,206
4,111,207
305.1 4,111,208
400 4,111,209

CLASS 130

30 R 4,111,210

CLASS 131

2 4,111,211
21 A 4,111,212
173 4,111,213
4,111,214

CLASS 133

3 A 4,111,216
3 C 4,111,215

CLASS 134

10 4,111,715
4,111,716

CLASS 135

15 PQ 4,111,217

CLASS 136

225 4,111,717
236 R 4,111,718

CLASS 137

2 4,111,218
3 4,111,219
39 4,111,220
67 4,111,221
69 4,111,222
115 4,111,223
207 4,111,224
240 4,111,225
269 4,111,226
435 4,110,649
469 4,111,227
512 4,111,228
557 4,111,342
614.17 4,111,229
625.5 4,111,230
852 4,111,231
882 4,111,232

CLASS 138

89 4,111,233
99 4,111,234
109 4,111,235
120 4,111,236
125 4,111,237

CLASS 139

436 4,111,238
438 4,111,239
449 4,111,240

CLASS 140

92.7 4,111,241
124 4,111,242

CLASS 141

102 4,111,243
348 4,111,244

CLASS 144

2 Z 4,111,245
193 A 4,111,246
316 4,111,247

CLASS 148

1.5 4,111,719
4,111,720
2 4,111,721
6.15 R 4,111,722
32 4,111,723
175 4,111,724
4,111,725
4,111,726

CLASS 149

2 4,111,727
19.5 4,111,728
19.9 4,111,729

CLASS 150

1.5 R 4,111,248

CLASS 152

187 4,111,250
219 4,111,251
330 RF 4,111,249

CLASS 156

62.2 4,111,730
86 4,111,731
96 4,111,732
204 4,111,733
234 4,111,734
384 4,111,735
4,111,736
458 4,111,737
4,111,738
486 4,111,739
498 4,111,740
504 4,111,741
617 SP 4,111,742

CLASS 162

16 4,111,743
100 4,111,744
271 4,111,745
272 4,111,746

CLASS 164

23 4,111,252
43 4,111,253
138 4,111,254
255 4,111,255
335 4,111,256

CLASS 165

9 4,111,257
40 4,111,258
104 S 4,111,260

CLASS 166

86 4,111,261
99 4,111,262

CLASS 172

54 4,111,263
59 4,111,264
4,111,265
4,111,266
4,111,267
805 4,111,268

CLASS 173

134 4,111,269

CLASS 174

16 R 4,112,247
50 4,112,248
68 B 4,112,249
87 4,112,251

CLASS 175

220 4,111,270
297 4,111,271

CLASS 176

40 4,111,747
68 4,111,748

CLASS 177

50 4,111,272

CLASS 178

58 R 4,112,252
4,112,253

CLASS 179

1 GA 4,112,256
1 GQ 4,112,255
1 VL 4,112,254
2 EB 4,112,257
15 AT 4,112,258
15 BT 4,112,259
18 FC 4,112,260
99 4,112,261
170 G 4,112,262
175.3 R 4,112,264
175.31 R 4,112,263

CLASS 180

14 R 4,111,273
25 R 4,111,274
68 R 4,111,275
117 4,111,276
122 4,111,277

CLASS 181

249 4,111,278
264 4,111,279
290 4,111,081

CLASS 182

8 4,111,280
10 4,111,281

CLASS 186

1 C 4,111,282

CLASS 187

9 R 4,111,283
29 R 4,111,284

CLASS 188

73.6 4,111,285

CLASS 192

3.27 4,111,287
38 4,111,288
58 B 4,111,289
98 4,111,290
105 C 4,111,291

CLASS 194

101 4,111,292

CLASS 195

2 4,111,749
31 F 4,111,750
66 R 4,111,751
103.5 M 4,111,752
126 4,111,753
127 4,111,754

CLASS 198

381 4,111,294
399 4,111,295
519 4,111,296

CLASS 200

31 R 4,112,265
38 C 4,112,266
43 4,112,267
48 SB 4,112,268
50 AA 4,112,269
50 C 4,112,270
52 R 4,112,271
61.58 R 4,112,272
67 D 4,112,273
146 R 4,112,274
147 R 4,112,275
148 R 4,112,276
153 J 4,112,277
156 4,112,278
181 4,112,279
296 4,112,282
302 4,112,283
340 4,112,284

CLASS 201

6 4,111,755
41 4,111,756

CLASS 202

93 4,111,757
138 4,111,758

CLASS 203

7 4,111,759

CLASS 204

26 4,111,760
4,111,761
28 Re.29,754
33 4,111,762
38 A 4,111,763
64 R 4,111,764
67 4,111,765
109 4,111,766
146 4,111,767
151 4,111,768
159.15 4,111,769
4,111,770
159.22 4,111,771
180 P 4,111,772
180 R 4,111,773
186 4,111,774
192 C 4,111,775
195 M 4,111,777
195 S 4,111,778
195 T 4,111,776
255 4,111,779
266 4,111,780
280 4,111,781
298 4,111,782
4,111,783
299 EC 4,111,784
299 R 4,111,785

CLASS 206

44.12 4,111,297
151 4,111,298
215 4,111,299
280 4,111,300
326 4,111,301
363 4,111,302
520 4,111,303
534 4,111,304
563 4,111,305
611 4,111,306

CLASS 208

8 4,111,786
10 4,111,787
4,111,788
11 LE 4,111,789
33 4,111,790
78 4,111,791
79 4,111,792
121 4,111,793
131 4,111,794
216 4,111,795
4,111,796

CLASS 209

14 4,111,797
172.5 4,111,798
273 4,111,799

CLASS 210

10 4,111,800
23 H 4,111,810
40 4,111,801
46 4,111,802
51 4,111,803
58 4,111,804
71 4,111,805
115 4,111,806
152 4,111,807
197 4,111,808
242 R 4,111,809
242 S 4,111,811
257 M 4,111,812
282 4,111,813
323 T 4,111,814
487 4,111,815

CLASS 211

1.5 4,111,307
59.1 4,111,308
104 4,111,309

CLASS 214

1 BC 4,111,311
1 QD 4,111,310
6 B 4,111,312
15 R 4,111,313
17 A 4,111,314
17 C 4,111,315
75 H 4,111,316
77 P 4,111,317
83.22 4,111,318
131 A 4,111,319
145 A 4,111,320
501 4,111,321

CLASS 215

230 4,111,322
4,111,323
232 4,111,324
4,111,325
247 4,111,326

CLASS 219

10.41 4,112,285
4,112,286
10.49 R 4,112,287
121 P 4,112,288
124.33 4,112,289
216 4,112,280
275 4,112,290
283 4,112,281
497 4,111,443

CLASS 220

3 4,111,327
4 R 4,111,328
266 4,111,329
306 4,111,330
319 4,111,331

CLASS 221

7 4,111,332
73 4,111,333
75 4,111,334

CLASS 222

57 4,111,335
58 4,111,336
146 HE 4,111,337
180 4,111,338
394 4,111,339
527 4,111,340

CLASS 223

106 4,111,341

CLASS 224

5 H 4,111,343
42.24 4,111,344

CLASS 225

1 4,111,345
96.5 4,111,346

CLASS 227

68 4,111,347

CLASS 228

181 4,111,348

CLASS 229

3.5 R 4,111,349
15 4,111,350
17 M 4,111,351
31 R 4,111,352
34 R 4,111,353
62.5 4,111,354

CLASS 233

20 R 4,111,355
26 4,111,356

CLASS 235

92 MP 4,112,291
449 4,112,292

CLASS 236

11 4,111,357
15 A 4,111,358

CLASS 237

1 A 4,111,259
4,111,359
4,111,360

CLASS 238

338 4,111,361

CLASS 239

1 4,111,362
20 4,111,363
77 4,111,364
93 4,111,365
222.17 4,111,366
333 4,111,367
394 4,111,368
400 4,111,369
533.3 4,111,370

CLASS 241

18 4,111,371
37.5 4,111,372
46.11 4,111,373
101.7 4,111,374

CLASS 242

18 PW 4,111,375
25 A 4,111,376
56 R 4,111,377
57 4,111,378
71.1 4,111,379
128 4,111,380
130.2 4,111,381

CLASS 244

3.1 4,111,382
3.13 4,111,383
4,111,384
4,111,385
17.27 4,111,386
155 A- 4,111,387

CLASS 248

49 4,111,388
162 4,111,389
274 4,111,390

CLASS 250

199 4,112,293
203 R 4,112,294
237 G 4,112,295
288 4,112,297
324 4,112,298
326 4,112,299
330 4,112,300
364 4,112,301
381 4,112,302
401 4,112,397
445 T 4,112,303
476 4,112,304
492 R 4,112,305
499 4,112,306
510 4,112,307
551 4,112,308
560 4,112,309
574 4,112,310

CLASS 251

5 4,111,391
174 4,111,393
214 4,111,392
4,111,394
306 4,111,395
328 4,111,396

CLASS 252

8.6 4,111,816
8.8 4,111,817
8.9 4,111,818
4,111,819
49.5 4,111,820
49.9 4,111,821
51.5 A 4,111,822
62.1 P 4,111,823
63 4,111,824
4,111,825
89 R 4,111,826
90 4,111,827
106 4,111,844
182 4,111,828
361 4,111,829
412 4,111,832
429 B 4,111,834
4,111,836
429 C 4,111,835
429 R 4,111,833
430 4,111,837
4,111,838
431 P 4,111,839
432 4,111,840
439 4,111,841
447 4,111,842
451 4,111,843
455 Z 4,111,845
4,111,846
463 4,111,847
466 PT 4,111,848
474 4,111,849
501 4,111,850
518 4,111,851
4,111,852
536 4,111,853
541 4,111,854
545 4,111,855

CLASS 254

150 R 4,111,397
175.5 4,111,398

CLASS 256

13.1 4,111,401
32 4,111,399
47 4,111,400

CLASS 260

5 4,111,867
17.4 ST 4,111,868
18 N 4,111,869
21 4,111,870
22 CB 4,111,871
23 R 4,111,874
4,111,875
23 XA 4,111,873
23.7 A 4,111,872
29.6 E 4,111,881
29.6 ME 4,111,878
29.6 MP 4,111,880
29.6 N 4,111,879
29.6 R 4,111,877
29.6 RB 4,111,876
30.6 R 4,111,882
4,111,883
4,111,884
31.6 4,111,888
31.8 M 4,111,889
31.8 R 4,111,885
31.8 T 4,111,886
37 AL 4,111,887
37 SB 4,111,890
38 4,111,891
4,111,911
40 R 4,111,892
4,111,893
4,111,894
42.18 4,111,895
4,111,896
42.33 4,111,897
42.53 4,111,898
45.7 P 4,111,900
45.75 B 4,111,905
45.75 N 4,111,904
45.75 S 4,111,903
45.8 A 4,111,902
45.8 N 4,111,901
45.8 R 4,111,899
45.95 R 4,111,977
112.5 R 4,111,923
4,111,924
4,111,925
117 4,111,926
123.5 4,111,927
124 R 4,111,928
146 R 4,111,929
207.5 4,111,930
239.1 4,111,932
4,111,933
239.3 B 4,111,931
4,111,934
281 GN 4,111,937
290 HL 4,111,938
293.58 4,111,942
293.6 4,111,939
4,111,940
4,111,941
294.8 D 4,111,943
296 R 4,111,944
297 R 4,111,945
4,111,946
299 4,111,947
302 R 4,111,948
306.8 D 4,111,949
308 R 4,111,950
326.2 4,111,951
326.41 4,111,953
326.5 FN 4,111,952

326.62 4,111,954
327 M 4,111,955
329 AM 4,111,956
332.2 C 4,111,957
340.7 4,111,958
340.9 R 4,111,959
4,111,960
345.8 R 4,111,961
346.71 4,111,962
346.75 4,111,963
347.7 4,111,964
348.16 4,111,965
359 R 4,112,017
373 4,111,966
396 R 4,111,967
410.9 R 4,111,969
438.5 R 4,111,970
4,111,971
439 R 4,111,972
448.2 E 4,111,973
448.8 R 4,111,974
449 L 4,111,975
453 RW 4,111,976
465 D 4,111,978
465.6 4,111,968
509 4,111,979
543 R 4,111,988
544 C 4,111,989
561 R 4,111,990
583 P 4,111,991
586 R 4,111,992
4,111,993
4,111,994
590 C 4,111,995
590 D 4,111,996
591 4,111,997
599 4,111,998
606.5 B 4,111,999
612 R 4,112,002
613 D 4,112,003
645 4,112,005
4,112,006
666 A 4,112,007
671 M 4,112,008
677 A 4,112,009
683.15 R 4,112,011
683.48 4,112,010
830 R 4,111,907
835 4,112,012
849 4,112,016
861 4,112,018
866 4,112,019
873 4,112,020
878 R 4,112,013
880 R 4,112,021
881 4,112,022
901 4,112,023
945 4,112,014
956 4,112,024

CLASS 261

29 4,112,025
4,112,026
92 4,112,015
151 4,112,027

CLASS 264

1 4,112,028
11 4,112,029
25 4,112,030
26 4,112,031
28 4,112,036
42 4,112,032
44 4,112,033
95 4,112,034
113 4,112,035
126 4,112,037
138 4,112,038
142 4,112,039
176 F 4,112,040
250 4,112,043
263 4,112,041
322 4,112,042

CLASS 266

58 4,111,403
4,111,404
158 4,111,405

CLASS 267

153 4,111,406
166 4,111,407

CLASS 269

289 R 4,111,408
304 4,111,409

CLASS 271

173 4,111,410
199 4,111,411
251 4,111,412

CLASS 272

1 R 4,111,413
62 4,111,414
94 4,111,415
96 4,111,416
136 4,111,417

CLASS 273

1 B 4,111,419
1 R 4,111,418
1.5 R 4,111,420
85 G 4,111,421
101 4,111,422
101.1 4,111,423
106.5 C 4,111,424
157 R 4,111,425
186 C 4,111,426
250 4,111,427
262 4,111,428
271 4,111,429

CLASS 274

9 A 4,111,431
9 B 4,111,430
15 R 4,111,432
23 R 4,111,433

CLASS 277

3 4,111,434
9 4,111,435
92 4,111,436
139 4,111,437
148 4,111,438
153 4,111,439
165 4,111,440
183 4,111,441

CLASS 279

16 4,111,442

CLASS 280

11.37 E 4,111,444
79.3 4,111,445
275 4,111,446
278 4,111,447
289 E 4,111,448
402 4,111,449
405 A 4,111,450
408 4,111,451
421 4,111,452
626 4,111,453
649 4,111,454
690 4,111,455
692 4,111,456
728 4,111,457
739 4,111,458
744 4,111,459

CLASS 281

29 4,111,460

CLASS 282

27.5 4,111,461
4,111,462

CLASS 285

25 4,111,463
111 4,111,464
114 4,111,465
133 R 4,111,466
136 4,111,467
190 4,111,468
256 4,111,469
320 4,111,470

CLASS 289

18 4,111,471

CLASS 290

44 4,112,311

CLASS 292

92 4,111,472
126 4,111,473
144 4,111,474
216 4,111,475
246 4,111,476
252 4,111,477

CLASS 293

63 4,111,478

CLASS 296

23 MC 4,111,479
28 R 4,111,480
39 R 4,111,481

CLASS 297

159 4,111,482
410 4,111,483
4,111,484

CLASS 298

1 B 4,111,485

CLASS 299

1 4,111,486
4,111,487
10 4,111,488
17 4,111,490
34 4,111,489

CLASS 300

21 4,111,491

CLASS 302

39 4,111,492
42 4,111,493

CLASS 303

6 C 4,111,494
4,111,495
92 4,111,496
110 4,111,497

CLASS 307

118 4,112,312
141 4,112,313
215 4,112,314
254 4,112,315
279 4,112,296
304 4,112,316
308 4,112,317
4,112,318

CLASS 308

5 R 4,111,498
72 4,111,499
187 4,111,500
201 4,111,501

CLASS 310

49 R 4,112,319
154 4,112,320
242 4,112,321
329 Re.29,755
339 4,112,322
348 4,112,323
353 4,112,324

CLASS 312

10 4,111,502
27 4,111,503
183 4,111,504
184 Re.25,751
209 4,111,505
211 4,111,506

CLASS 313

95 4,112,325
4,112,326
337 4,112,327
486 4,112,328
491 4,112,329

CLASS 315

46 4,112,330
125 4,112,331
169 TV 4,112,332
4,112,333
171 4,112,334
241 R 4,112,335
362 4,112,336
411 4,112,337

CLASS 316

27 4,111,507

CLASS 318

59 4,112,338
227 4,112,339
331 4,112,340
370 4,112,341
599 4,112,342
674 4,112,343
685 4,112,344
696 4,112,345

CLASS 323

4 4,112,346
6 4,112,347
43.5 S 4,112,348

CLASS 324

3 4,112,349
16 R 4,112,350
4,112,351
30 R 4,112,352
54 4,112,353
4,112,354
57 R 4,112,355
71 SN 4,112,356
72 4,112,357
78 D 4,112,358
78 E 4,112,359
80 4,112,360
92 4,112,361
158 F 4,112,364
158 P 4,112,363
158 R 4,112,362
173 4,112,365
208 4,112,366
244 4,112,367

CLASS 325

32 4,112,368
34 4,112,369
40 4,112,370
319 4,112,371
321 4,112,372
440 4,112,373
446 4,112,374
452 4,112,375
455 4,112,376
461 4,112,377
464 4,112,378

CLASS 328

5 4,112,379
62 4,112,380
150 4,112,381
181 4,112,382

CLASS 329

50 4,112,383

CLASS 330

141 4,112,384
262 4,112,385
265 4,112,386
285 4,112,387

CLASS 331

94.5 D 4,112,388
94.5 G 4,112,390
94.5 H 4,112,389
94.5 PE 4,112,391
4,112,392
109 4,112,393

CLASS 333

6 4,112,394
17 M 4,112,395
30 R 4,112,396
73 R 4,112,398

CLASS 335

106 4,112,399
128 4,112,400
206 4,112,401
252 4,112,402

CLASS 336

12 4,112,403
133 4,112,404

CLASS 337

4 4,112,405
338 4,112,406
398 4,112,407

CLASS 338

32 H 4,112,408
222 4,112,409
243 4,112,410
322 4,112,250

CLASS 339

14 P 4,111,509
14 R Re.29,752
17 F 4,111,510
64 R 4,111,511
105 4,111,512
112 R 4,111,515
113 R 4,111,516
143 R 4,111,513
186 R 4,111,514
198 GA 4,111,517
252 R 4,111,518

CLASS 340

1 R 4,112,411
15.5 TS 4,112,412
27 R 4,112,413
146.1 E 4,112,414
146.3 SY 4,112,415
147 R 4,112,416
324 AD 4,112,422
4,112,423
336 4,112,424
347 AD 4,112,425
347 C 4,112,426
4,112,427
347 NT 4,112,428
365 R 4,112,429
550 4,112,420
560 4,112,419
605 4,112,417
659 4,112,418

CLASS 343

100 R 4,112,430
112 D 4,112,421
768 4,112,431
786 4,112,432

CLASS 346

1 4,112,433
33 ME 4,112,434
140 R 4,112,435
4,112,436
159 4,112,437

CLASS 350

3.66 4,111,519
96.12 4,111,520
96.13 4,111,521
96.14 4,111,523
96.19 4,111,524
96.21 4,111,522
96.31 4,111,525
162 SF 4,111,526
174 4,111,527
175 E 4,111,528
189 4,111,558
225 4,111,529
252 4,111,530
293 4,111,531
307 4,111,532
337 4,111,533
345 4,111,534

CLASS 351

160 4,111,535

CLASS 352

132 4,111,536

CLASS 353

66 4,112,438
78 4,111,149
101 4,111,537
122 4,111,538

CLASS 354

23 D 4,112,439
4,112,440
24 4,112,441
31 4,112,442
4,112,443
50 4,112,446
85 Re.29,756
106 4,112,444
145 4,112,447
173 4,112,449
235 4,112,450
239 4,112,448
258 4,112,451
322 4,112,452
330 4,112,453
4,112,454

CLASS 355

3 R 4,111,539
4 4,111,540
8 4,111,541
14 4,111,542
4,111,543
4,111,544
15 4,111,545
4,111,546
24 4,111,547
30 4,111,548
68 4,111,549
75 4,111,550
84 4,111,551

CLASS 356

4 4,111,552
36 4,111,553
4,111,554
86 4,111,556
141 4,111,555
168 4,111,557
201 4,111,559
205 4,111,560
225 4,111,561
244 4,111,562
4,111,563
247 4,111,564

CLASS 357

23 4,112,455
24 4,112,456
30 4,112,457
38 4,112,458

CLASS 358

6 4,112,459
29 4,112,460
63 4,112,461
104 4,112,462
105 4,112,463
122 4,112,464
127 4,112,445
190 4,112,465
241 4,112,466
257 4,112,467
280 4,112,468
296 4,112,469

CLASS 360

88 4,112,470
98 4,112,471
102 4,112,472

CLASS 361

1 4,112,473
15 4,112,474
33 4,112,475
42 4,112,476
155 4,112,477
162 4,112,478
243 4,112,479
271 4,112,480
395 4,112,481

CLASS 362

108 4,112,482
298 4,112,483
314 4,112,484
369 4,112,485
419 4,112,486

CLASS 364

200 4,112,487
4,112,488
4,112,489
4,112,490
415 4,112,491
442 4,112,492
476 4,112,493
510 4,112,494
700 4,112,495
728 4,112,496
4,112,497
4,112,498
732 4,112,499
900 4,112,500
4,112,501
4,112,502

CLASS 365

29 4,112,503
77 4,112,504
96 4,112,505
154 4,112,508
181 4,112,506
184 4,111,507
185 4,112,509
187 4,112,510
188 4,112,511
203 4,112,512
222 4,112,513
4,112,514

CLASS 366

17 4,112,515
80 4,112,516
102 4,112,517
219 4,112,518
266 4,112,519
337 4,112,520
338 4,111,402

CLASS 400

208 4,111,293
708 4,111,565

CLASS 401

6 4,111,566
202 4,111,567

CLASS 403

2 4,111,568
5 4,111,569
18 4,111,570
27 4,111,571
28 4,111,572
42 4,111,573
54 4,111,574
104 4,111,575
134 4,111,576
172 4,111,577
189 4,111,578
387 4,111,579

CLASS 404

10 4,111,581
47 4,111,582
69 4,111,583
4,111,584
70 4,111,585

CLASS 405

14 4,110,990
131 4,110,988
147 4,110,992
157 4,110,991
158 4,110,994
228 4,110,993
248 4,110,989

CLASS 407

16 4,111,586
91 4,111,587
114 4,111,589

CLASS 408

14 4,111,590
110 4,111,588
117 4,111,591
197 4,111,592
204 4,111,593

CLASS 415

1 4,111,594
90 4,111,595
115 4,111,596
143 4,111,597
202 4,111,598
215 4,111,599

CLASS 416

2	4,111,600
41	4,111,601
89	4,111,602
95	4,111,603
97 R	4,111,604
141	4,111,605
224	4,111,606

CLASS 417

46	4,111,607
112	4,111,608
243	4,111,609
332	4,111,610
360	4,111,611
372	4,111,612
394	4,111,613
420	4,111,614
423 A	4,111,615
472	4,111,616

CLASS 418

61 B	4,111,617
152	4,111,618

CLASS 422

12	4,111,831
17	4,111,830
26	4,111,654
48	4,111,659
117	4,111,661
124	4,111,655
191	4,111,663
231	4,111,662

CLASS 423

7	4,112,044
	4,112,045
8	4,111,660
53	4,112,046
123	4,112,047
210	4,112,048
223	4,112,050
	4,112,051
226	4,112,049
228	4,112,052
239	4,112,053
245	4,112,054
261	4,112,055
313	4,112,118
329	4,112,056
342	4,112,057
415 A	4,112,058
447.6	4,112,059
450	4,112,060
512 A	4,112,061
580 H	4,112,062
633	4,112,063

CLASS 424

1	4,112,064
45	4,112,065
48	4,112,066
78	4,112,067
89	4,112,068
93	4,112,069
101	4,112,070
118	4,112,071
155	4,112,072
177	4,112,073
	4,112,074
180	4,112,075
	4,112,076
185	4,112,077
195	4,112,078
	4,112,079
200	4,112,080
	4,112,081
209	4,112,082
215	4,112,083
226	4,112,084
245	4,112,085
246	4,112,086
	4,112,087
	4,112,088
248.55	4,112,089
250	4,112,091
	4,112,092
	4,112,093
	4,112,094
	4,112,095
251	4,112,090
	4,112,096
	4,112,097
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263	4,112,099
	4,112,100
	4,112,101
266	4,112,102
267	4,112,103
270	4,112,104
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	4,112,106
	4,112,107
272	4,112,108
273 P	4,112,109
	4,112,227
274	4,112,110
	4,112,111
	4,112,112
275	4,112,113
285	4,112,114
300	4,112,115
301	4,112,116
304	4,112,117
317	4,112,119
323	4,112,120
346	4,112,121

CLASS 425

43	4,111,619
66	4,111,620
97	4,111,621
112	4,111,622
129 R	4,111,623
135	4,111,624
174.8 E	4,111,625
203	4,111,626
215	4,111,631
382 R	4,111,632
421	4,111,627
445	4,111,628
451	4,111,633
451.2	4,111,629
462	4,111,630
505	4,111,634
533	4,111,635

CLASS 426

19	4,112,122
72	4,112,123
234	4,112,124
250	4,112,125
	4,112,126
283	4,112,127
330.4	4,112,128
417	4,112,129
471	4,112,130
582	4,112,131
603	4,112,132
650	4,112,133

CLASS 427

10	4,112,134
11	4,112,135
34	4,112,149
36	4,112,136
38	4,112,137
54	4,112,138
	4,112,139
	4,112,146
100	4,112,147
126	4,112,140
142	4,112,141
166	4,112,142
191	4,112,143
223	4,112,144
248 C	4,112,148
274	4,112,145
284	4,112,150
322	4,112,151
385 R	4,112,152
390 E	4,112,153
401	4,112,154
439	4,112,155
444	4,112,156

CLASS 428

1	4,112,157
35	4,112,158
36	4,112,159
95	4,112,161
106	4,112,162
107	4,112,163
116	4,112,164
134	4,112,165
141	4,112,166
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212	4,112,170
213	4,112,171
215	4,112,172
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220	4,112,174
236	4,112,175
304	4,112,176
	4,112,177
306	4,112,178
325	4,112,179
332	4,112,180
336	4,112,181
	4,112,182
363	4,112,183
403	4,112,184
	4,112,185
411	4,112,186
436	4,112,188
443	4,112,189
457	4,112,190
460	4,112,160
474	4,112,187
497	4,112,191
511	4,112,192
539	4,112,193
	4,112,194
542	4,112,195
594	4,112,196
629	4,112,197

CLASS 429

27	4,112,198
29	4,112,199
54	4,112,200
62	4,112,201
94	4,112,202
104	4,112,203
181	4,112,204
199	4,112,205

CLASS 431

2	4,111,636
4	4,111,641
12	4,111,637
13	4,111,638
25	4,111,639
46	4,111,640
347	4,111,642

CLASS 432

48	4,111,643
179	4,111,644

CLASS 521

25	4,111,858
30	4,111,856
33	4,111,859
53	4,111,866
55	4,111,862
63	4,111,863
84	4,111,860
117	4,111,864
123	4,111,861
137	4,111,865

CLASS 526

3	4,112,206
6	4,111,920
17	4,112,207
57	4,112,208
65	4,112,209
187	4,112,210
219	4,112,211
234	4,112,212
264	4,111,919
279	4,112,213
292	4,111,922

CLASS 528

45	4,111,912
	4,111,917
48	4,111,914
58	4,111,915
73	4,111,918
75	4,111,916
123	4,111,909
226	4,111,857
229	4,111,906
273	4,111,913
338	4,111,921
361	4,111,908
494	4,112,214
503	4,112,215

CLASS 536

1	4,112,216
4	4,112,217
5	4,112,218
17	4,112,219
18	4,112,220
24	4,112,221
111	4,112,222
114	4,112,223

CLASS 542

426	4,112,224
	4,112,225
461	4,112,226

CLASS 544

26	4,112,228
105	4,112,229
	4,112,230
174	4,112,231
192	4,112,232
224	4,111,935
239	4,111,936

CLASS 548

312	4,112,233
342	4,112,234

CLASS 560

1	4,112,235
12	4,112,236
	4,112,237
70	4,112,238
73	4,112,239
112	4,112,240
246	4,112,241

CLASS 562

401	4,111,980
	4,111,987
444	4,111,981
519	4,111,982
535	4,111,983
538	4,111,984
546	4,111,985
549	4,111,986

CLASS 568

726	4,112,242
734	4,112,000
768	4,112,243
	4,112,244
855	4,112,001
861	4,112,004
864	4,112,245

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	190	249,197		189	249,214			249,231		106	249,248		9	249,265
	241	249,198		190	249,215			249,232			249,249		14	249,266
	274	249,199		191	249,216		219	249,233		114	249,250		15	249,267
	311	249,200		200	249,217			249,234	D11—	19	249,251		69	249,268
D3—	19 R	249,201	D7—	5	249,218			249,235		88	249,252		90	249,269
D6—	29	249,202		43	249,219			249,236		128	249,253	D16—	83	249,270
	31	249,203		129	249,220			249,237	D12—	61	249,254	D19—	37	249,271
	38	249,204		137	249,221			249,238		91	249,255		75	249,272
	55	249,205	D8—	14	249,222		222	249,239		103	249,256		78	249,273
	73	249,206			249,223		231	249,240		182	249,257	D22—	31	249,274
	89	249,207		313	249,224		239	249,241		187	249,258	D23—	4	249,275
	95	249,208		330	249,225	D10—	5	249,242	D13—	18	249,259		40	249,276
	113	249,209		367	249,226		31	249,243	D14—	6	249,260		150	249,277
	114	249,210		387	249,227		32	249,244			249,261	D24—	2	249,278
	161	249,211	D9—	44	249,228		53	249,245		10	249,262		7	249,279
		249,212			249,229		78	249,246			249,263			

	50	249,280												
D27—	03	249,281												
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	4,111,573		4,112,148	51 :	4,110,865		4,111,245	55 :	4,110,860		4,112,248
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	4,111,610		4,112,342		4,111,282		4,111,273		4,110,904		4,112,265
	4,111,770		4,112,353		4,111,417		4,111,580		4,110,925		4,112,282
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	4,111,791		4,112,412		4,111,551		4,111,831		4,111,006		4,112,402
	4,111,894		4,112,421		4,111,564	54 :	4,111,840		4,111,013		4,112,458
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	4,111,896		4,112,495		4,112,161		4,111,876		4,111,174		4,112,479
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DESIGN PATENTS

6 :	249,223		249,275		249,295		249,282		249,272	47 :	249,242
	249,226		249,280	20 :	249,253	29 :	249,227	39 :	249,202		249,289
9 :	249,247		249,283		249,269	31 :	249,239		249,210		249,290
06 :	249,197		249,284	21 :	249,213	34 :	249,199		249,222	48 :	249,214
	249,201		249,286	24 :	249,204		249,268		249,254		249,219
	249,207		249,294		249,281	36 :	249,198		249,274		249,262
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	249,217	09 :	249,196	26 :	249,205		249,228	43 :	249,234	51 :	249,241
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	249,243	12 :	249,288		249,258		249,248		249,236	55 :	249,203
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	249,257		249,273		249,267		249,270				

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[Notice of Dec. 16, 1969, 869 O.G. 6877]

17 :	T974,001		T974,002	34 :	T974,003						

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